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AUSTRALASIAN ASSOCIATION FOR THE ADVANCEMENT
OF SCIENCE.

THE MARINE FAUNA OF QUEENSLAND.

ADDRESS

BY

THE PRESIDENT OF SECTION D

CHARLES HEDLEY, F.L.S.,
Assistant Curator of the Australian Museum, Sydney.

BRISBANE:
BY AUTHORITY: ANTHONY JAMES CUMMING, GOVERNMENT PRINTER.

1909.

Section D.

BIOLOGY.

ADDRESS BY THE PRESIDENT,

CHARLES HEDLEY, F.L.S.,

Assistant Curator of the Australian Museum, Sydney.

THE MARINE FAUNA OF QUEENSLAND.

1.—A PLEA FOR A BIOLOGICAL STATION.

The occupant of this chair has the privilege of delivering an address on some subject with which his section is concerned. The nearer that subject is to speaker and audience the better, and I find a topic at hand for discussion in the Marine Fauna of Queensland.

We will consider this fauna politically as a public asset, and scientifically as a field for investigation.

The man of science, who is a good citizen, while indulging in the intellectual pleasures of his work, keeps watch on matters within his ken of public weal.

So we will first discuss the advantage of establishing a biological station. Last year the Royal Commission which reported on the pearlshell and bêche-de-mer industries, recommended that a competent staff of marine biologists should be stationed in Torres Strait to discover and publish information on the pearlshell and bêche-de-mer.

In its marine fauna, Queensland has a great national asset. Few countries are so well endowed. Even without cultivation a rich harvest has been reaped of oysters, pearlshell, bêche-de-mer, turtle, tortoiseshell, fish, dugong, and other products. The great extent of sheltered water offers facilities for the cultivation of these, and of foreign articles, such as sponge and precious coral.

It is so simple to gather and to sell the produce of the sea, that we fail to realise how the fisherman's earnings may be increased by exact knowledge and systematic research. But the reward which the miner has obtained, and which the farmer is reaping, is in store for the fisherman also.

For it was the science of metallurgy that raised mankind from the Stone Age. It was the science of the commercial and industrial arts that placed Europe in the lead of the world. The successful application of science to agriculture has been demonstrated in the Queensland sugar-mills, butter-factories, and frozen-meat trade. Last among industries to feel the fructifying touch of science are the fisheries.

In Ceylon, for twelve barren years the pearl fisheries lay idle. Then the aid of skilled investigators was sought, and the industry placed on a sound footing. For the last five years an annual harvest worth £100,000 has been reaped.

But for the last decade in Queensland there has been a steady decrease year by year. Thus:—

Total Take for—	Tons of Pearlshell.	Total Take for—	Tons of Pearlshell.
1897 ...	... 1,223	1903 ...	... 908
1898 ...	... 1,061	1904 ...	... 777
1899 ...	... 1,200	1905 ...	... 527
1900 ...	... 1,060	1906 ...	... 444
1901 ...	... 867	1907 ...	... 567
1902 ...	... 910		

and, alas, the tide has not yet turned.

Not only in Ceylon, but also in Japan and the United States of America, has the Government granted the means for the study of marine life. And these efforts have everywhere proved remunerative.

A well-organised and liberally-endowed establishment is required. From time to time in the past, Queensland has met this call by appointing a single officer, without aid or equipment. Some of the problems of our fisheries are as difficult and intricate as any which confront science. Time and the combined efforts of skilled zoologists are required for their solution.

Opinions delivered by the judge from the bench or the priest from the pulpit carry a weight which does not attach to an unofficial utterance. And so, speaking from this Presidential Chair, I express the earnest hope that the Queensland Government will soon give effect to the chief recommendation of the Royal Commission of 1908, and establish a biological station in Torres Strait.

2.—THE EVOLUTION OF THE QUEENSLAND COAST.

The uniformity of the Indo-Pacific marine fauna is a theme of text-books. From the Red Sea to the Hawaiian Islands is an enormous distance, yet the marine fauna of this belt maintains a constant aspect and numerous species range throughout. This Indo-Pacific Province is subdivided into regions, among which the Solanderian, as I have termed that under consideration, is as distinct as any. On the south the Queensland fauna is limited by the cooler waters of New South Wales, and on the north the volume of fresh water issuing from the Fly and neighbouring rivers is an impediment to emigration and immigration.

A considerable proportion of our fauna is as yet unknown abroad. Further research will, however, alter the proportion of endemic forms both by the discovery of Queensland forms beyond our limits, and by the recognition in our waters of species described from Japan, the Philippines, and elsewhere. But the completed returns will follow the direction indicated by incomplete data. We note the absence from our beaches of several genera, such as *Harpa*, which otherwise range over the whole Indo-Pacific area. *Cypræa mauritiana*, one of the commonest and widest-spread Indo-Pacific forms, is yet one of the rarest Queensland shells, presumably a recent immigrant not yet established.

A glance at the physical evolution of the Coral Sea and east coast of Queensland, may suggest a clue to the isolation and peculiarity of our fauna.

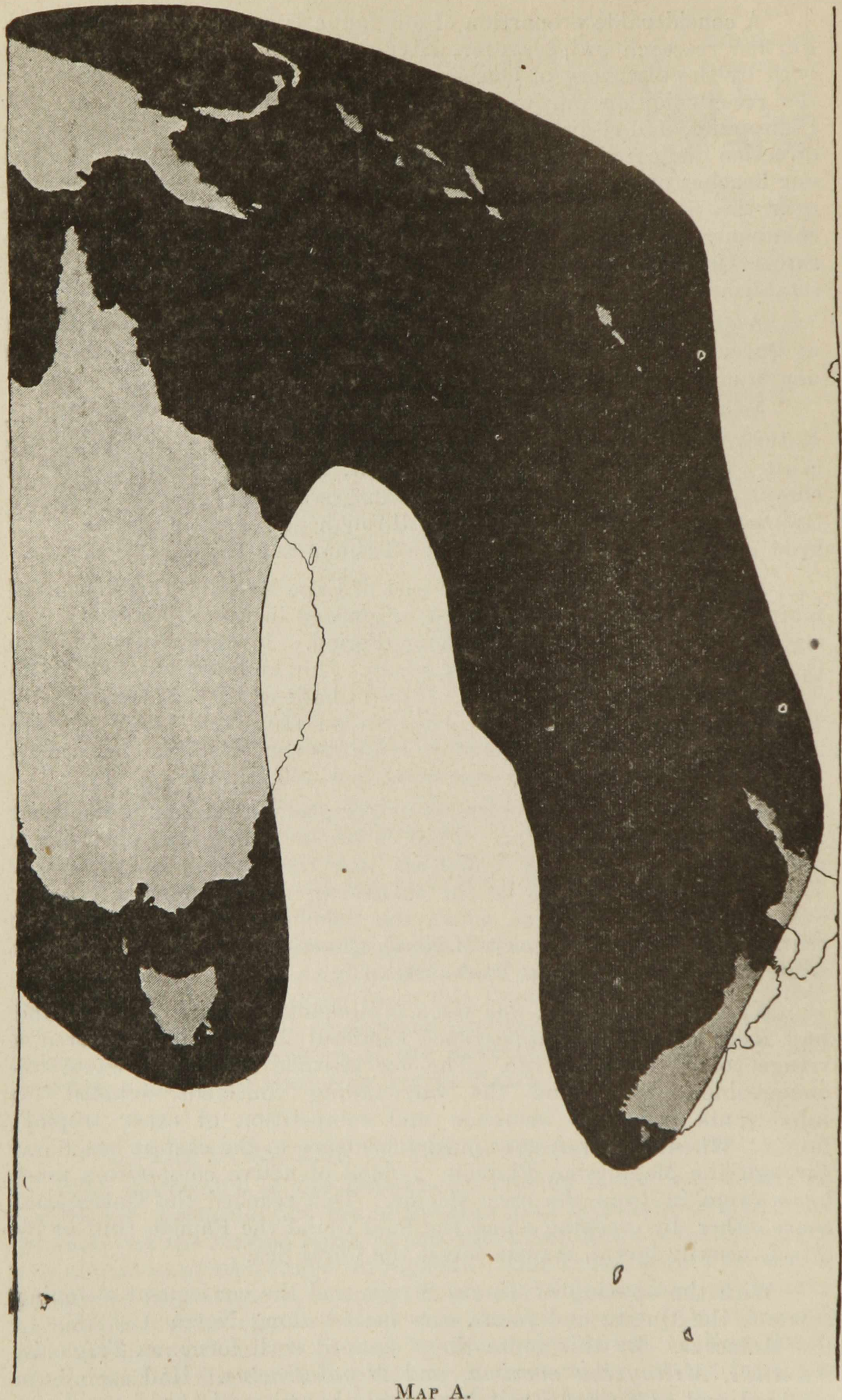
According to Neumayr (Denkschr. k. Akad. d. Wiss. Wien., Math., Naturw. cl. L., Abth. I., Karte I.), a meridional crease in the earth's crust produced in Jurassic times a gulf, which he called the Gulf of Queensland, whose western shore transgressed the present east Australian coast (Map A). Enlarging through geological cycles this gulf grew into what we now know as the Tasman and the Coral Seas.

South of the Louisiades, and east of Cape Melville, there occurred a sink which I venture to suggest originated in the Mesozoic, and increased during the whole Tertiary Period. It developed into the Carpenter Deep of modern geographers. Our knowledge of this basin is drawn from the observations of the "Challenger." In a traverse of 1,000 miles this great basin preserves an unbroken depth of more than 2,000 fathoms. Temperature readings show it to be enclosed by an unmapped rim, whose lowest point is 1,300 fathoms.

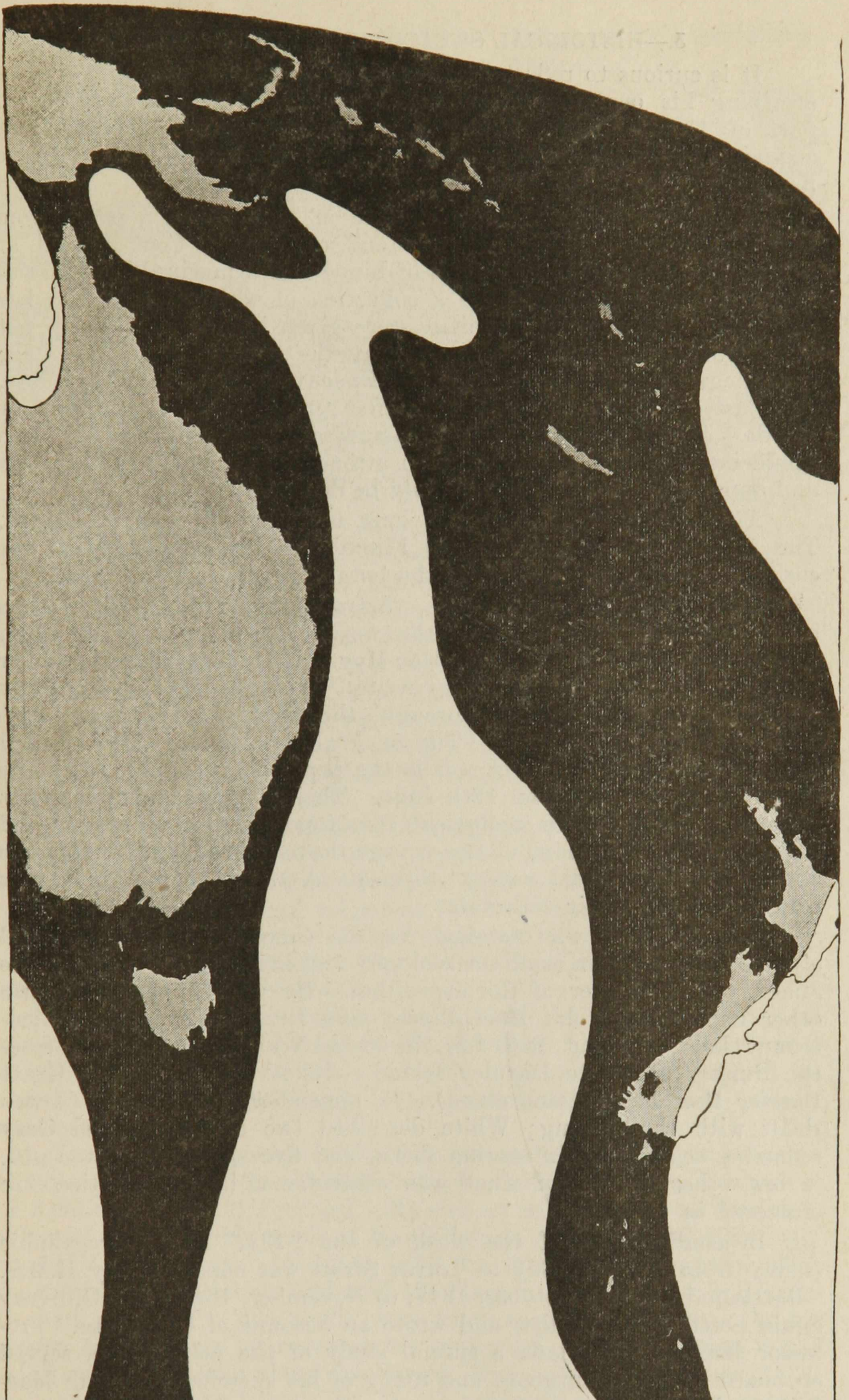
As the Mesozoic sink enlarged its periphery it became a dominant factor in land configuration. First it broke through an older inner earth fold of which New Caledonia and the Louisiades are relics. Then continuing its work to the eastwards, it submerged a younger outer continental ridge on which the Solomons stand. Westerly it crumpled up the former coast of North Queensland, and, by a furthest western effort, broke open Torres Strait.

While the Coral Sea was yet a prolongation of the old Gulf, and had more or less the appearance sketched in Map B, it offered a refuge to old forms of life. The low latitude afforded a warm unchangeable climate, and the surrounding continent secluded its inhabitants from the incursion and competition of other tropical fauna. When, however, continued subsidence to the east at last burst through the Melanesian Plateau, a flood of active competitors must have swept in from the open Pacific. This reached the Queensland coast either by creeping along the land round the Papuan Gulf or by direct, usually larval, transit across the Coral Sea.

With the opening of Torres Strait, and the consequent outgoing current, the Queensland fauna was spread along North Australia to the Moluccas. By this route there escaped such forms as *Trigonia*, *Nautilus*, *Meleagrina maxima*, and *Megalatractus*. Had such been retained east of Torres Strait they would have greatly heightened the peculiarity of the Solanderian fauna.



MAP A.
THE QUEENSLAND COAST IN TRIASSIC TIMES, AFTER NEUMAYR.



Map B.
The Queensland Coast at the close of the Mesozoic Epoch. Original.

3.—HISTORICAL SKETCH OF INVESTIGATION.

It is curious to reflect that, unless Flinders was over generous in ascribing his own discoveries to his predecessors, the first known part of Queensland was that with which the world is now least acquainted—viz., Batavia River, Pera Head, Duyfhen Point, and Cape Keerweer in the Gulf of Carpentaria.

A naturalist first trod Queensland in 1770, when a party from the "Endeavour" under the command of Captain Cook landed at Bustard Head. Solander, a pupil of Linné and a marine biologist, was there, and he doubtless made a collection of which history has left no record. Further opportunities were given him when the ship put into Broadsound, when she called at the Palm Islands, at Cape Grafton, when she grounded on the Endeavour Reef in Weary Bay, and, lastly, when she was beached for repairs where Cooktown now stands. A final visit was paid to Possession Island, but here etiquette would insist that all the gentlemen attend the ceremony in full dress and opportunity for collecting would be denied them.

After Cook, Queensland lay long unvisited by men of science. The famous Brown accompanied Flinders in his exploration of the coast, but his record belongs to the botanical side of our science.

Two French men-of-war, the "Astrolabe" and the "Zélée," then on a scientific mission round the world, sailed by way of Bligh Entrance into Torres Strait on 31st May, 1840. They anchored under Darnley, whose native name they write "Aroub," and landed a party of observers. Proceeding through the Strait, both ships were stranded on the reef near Tut or Warrior Island. The "Canal Mauvais" of modern charts recalls the perils they endured. Finally they cleared the Strait on 12th June. Their dangers and discomforts were not conducive to zoological investigation, but Hombron and Jacquinot, the historians of the voyage, have figured a fish and some shells from Queensland waters. Subsequent writers refer to numerous other species of their collection.

H.M.S. "Fly" was detailed for the survey of the Queensland coast. She carried a brilliant zoologist and ardent collector, J. Beete Jukes, the chronicler of the expedition. He was supported by two other naturalists, John MacGillivray and Dr. Gray's nephew, Lieutenant Ince. During 1843-4-5, the vessel traversed the coast from the Bunker Group to Darnley Island. Jukes' account of the Great Barrier Reef has become classic. In appendices to his book, Owen dealt with the dugong; White described two crustacea, and Gray named a sea-snake, six marine shells, and five species of Asteriadæ. A few other notices of what was evidently a large collection are scattered in literature.

In continuation of the work of the "Fly," the hydrographic survey from Moreton Bay to Torres Strait was conducted by H.M.S. "Rattlesnake," from October, 1847, to November, 1849. MacGillivray again acted as naturalist, and wrote an account of the cruise. Professor Huxley, who made a special study of the pelagic life, served on board as junior surgeon, and many of his sketches illustrate MacGillivray's book.

In various appendices, two Queensland crustacea are figured and described by White; Busk recorded twenty-seven Polyzoa; and Professor

Forbes wrote an admirable account of the "Bathymetrical Distribution of marine Testacea on the Eastern coast of Australia."

This fragment suggests how great was the loss which science sustained through the waste of material carried to London. These explorers found the British official authorities indifferent and apathetic. London had no Lamarck to grasp the opportunity, to value what had been gathered with such difficulty and danger, and to infuse his zeal into others for the realisation of knowledge from the raw material.

The naturalists of the "Endeavour," the "Fly," and the "Rattlesnake" had laboured hard, and accumulated important collections. These seem either to have been thrown into the vaults of a museum, or to have been dissipated among fanciers and curio-mongers. The plants gathered by Captain Cook's party were lately published after a hundred years of neglect. Those brought home by Dampier in 1688 and 1699 lay undetermined for an even longer period.

The shells of MacGillivray seem to have passed into the hands of Cuming. Hugh Cuming was an illiterate sailor, whose history shows him as a man of strong character, a master organiser, and one born to success. He aimed to have the finest collection of shells in the world, and he reached it. Unfortunately his plans did not regard the advancement of science, and the strong man wastes no energy on aught but the attainment of his object.

For purposes of sale or exchange an unnamed shell was of less value to him than one named, so names were needed for his wares. More time for determination and description was required by careful writers. But worse authors quickly supplied names good or bad, and doubtless better submitted to Cuming's dictation as to what constituted a different species.

So the leading conchologists of his generation in England, Gray, Woodward, Forbes, Hanley, and Carpenter had little or no dealings with Cuming. Gray, indeed, seems to have quarrelled outright. The naming of Cuming's huge collection fell to weaker men—Reeve, the Sowerbys, and the Adams. It has happened that these renamed the same species twice or thrice. The least amount of work necessary to carry the name satisfied them.

Though "the exact locality, depth, and character of habitat of each species of mollusk taken" by MacGillivray "were carefully noted at the time of capture," these valuable field notes were despised by the dealer into whose hands they passed, and failed to attain publication.

The name of Strange is one that occurs frequently as a collector of type specimens of Queensland shells. Frederick Strange was a native of Aylsham, Norfolk, England. He was an early visitor to Brisbane, a friend and probably pupil of MacGillivray. He collected vigorously round Moreton Bay. In June, 1852, he returned to England after fourteen years' absence, and sold the large natural history collection he had gathered. The shells were purchased by Cuming. On his return to Brisbane he renewed his zoological work by fitting out a small vessel to collect along the Barrier Reef. On 15th October, 1854, he landed on Percy Island No. II., in company with Mr. Spurling, a conchologist, and Mr. Walter Hill, afterwards Director of the Botanic Gardens of Brisbane, and first Colonial Botanist of Queensland. Hill pushed into the interior for plants, while his companions strayed along the beach for shells. On his return, Hill found the bodies of his comrades, murdered by the aboriginals.

From October, 1853, to November, 1855, Samuel Stutchbury, then Government Geologist for New South Wales, travelled through extra-tropical Queensland. He apparently collected marine animals where opportunities occurred, but there is little record of his work. *Melampus Stutchburyi*, Pfeiffer, perpetuates his memory.

Commodore Loring, C.B., when in command of H.M.S. "Iris," dredged off the coast. He obtained *Nucula loringi*, Adams and Angas; and *Limopsis loringi;* the date of his work is about 1856-7-8.

About 1858, George French Angas, some time Secretary to the Australian Museum, Sydney, visited Queensland on a collecting and sketching expedition (*vide* autobiography, "The Little Journal," London, May, 1884, Vol. I., No. 3, pp. 230-234). Some Queensland records are scattered through his conchological papers.

In 1868 an energetic lady, Frau Amalie Dietrich, visited Queensland in the interests of the Godeffroy Museum in Hamburg. She collected at Brisbane, Rockhampton, Mackay, Bowen, Holborn Island, and Cape York, and remitted to Europe extensive series of fish, mollusca, crustacea, echinodermata, corals, and alcyonaria.

An expedition to observe the solar eclipse of 1871 was organised by Australian astronomers. Mr. J. Brazier accompanied the party, and collected at Percy, Fitzroy, and No. VI. Claremont Group; the latter subsequently known as Eclipse Island. He described the collections then gathered in the Proc. Zool. Soc., 1874, pp. 668-672, Pl. LXXXIII.; and Journ. of Conch., II., 1879, pp. 186-199. A new species was dedicated to each astronomer of the party.

A new era was inaugurated by the visit of the "Challenger," which, during her famous voyage round the world, spent a few days at Cape York, and passed through Torres Strait.

On 31st August, 1874, a collecting party was landed on Raine Island, while the ship proceeded to sound and dredge in the vicinity (Station 185). A couple of hauls were taken in 135 and 155 fathoms respectively.

For a week following 1st September the "Challenger" anchored under Cape York, while the scientific staff were engaged dredging and shore collecting round the Cape, Somerset, Albany Island, and Albany Pass. On 8th September the ship sailed for Wednesday Island (Station 186) and hauled the dredge in 8 fathoms north of the island. Meanwhile, Mr. J. Murray had spent the day dredging from a boat along Flinders Passage. On 9th September a party was landed on Booby Island, where the lighthouse now stands, while the dredge and trawl were worked in the vicinity (Station 187). The "Challenger" then left Australian waters, and proceeded on her voyage to the Aru Islands.

Cape York proved a rich collecting ground, the results were exhaustively worked out, and afford a wealth of information on Queensland zoology. From Stations 185-187, nearly eight hundred marine animals are recorded, comprising the following groups:—Fish, 33; Tunicata, 6; Mollusca, 223; Bryozoa, 17; Crustacea, 119;

Echinodermata, 41; Annelida, 4; Myzostomidæ, 5; Actinozoa, 35; Hydrozoa, 8; Spongidæ, 23; and Foraminifera, 268. Detailed descriptions of most of these appear in the various zoological reports of the expedition.

A voyage of zoological research was undertaken by Sir William Macleay, the results of which were published by the society he founded. Such expert collectors as Messrs. Masters, Petterd, Brazier, and Spalding were included in his staff. His vessel, the "Chevert," touched first, 29th May, 1875, at the Percy Group. Then Brooke, North Barnard, and Fitzroy Islands were visited in succession. The coral cays of Low Woody and Turtle Reef engaged his attention. On 9th June the ship anchored at No. 4 Howick Group. Cruising northwards by easy stages, the Flinders Group, Cape Grenville, and Cape Sidmouth were visited. From an anchorage near Somerset, the party spent more than a week in exploring Cape York and the Albany Pass. Leaving the mainland on 26th June, the expedition entered Torres Strait. Waraber [Sue] and Tut [Warrior] were visited, whence the "Chevert" steered for the Papuan coast. Becoming involved in the maze of reefs, she retraced her route south, and proceeded to Erub [Darnley] by way of Giaka [Dungeness], Sasi [Long], Burar [Bet], Waraber [Sue], Masig [Yorke], and Edugor [Nepean]. From 31st July to 13th August, the most profitable time was spent at Erub, dredging and shore collecting. And here, as far as Queensland is concerned, the expedition terminated.

The fish, estimated at 800, were studied by Dr. Alleyne and Sir W. Macleay in the early volumes of the "Proceedings of the Linnean Society of New South Wales." The Gasteropoda, exceeding 600, procured by the "Chevert," were catalogued by Mr. J. Brazier, in the first three volumes of the same serial. Professor Haswell's "Monograph of Australian Crustacea" (1882) include the "Chevert" captures. Echini were determined by the Rev. J. E. Tenison-Woods (P.L.S., N.S.W., I., pp. 145-176), who also dealt with the corals and polyzoa (*op. cit.*, III., 1878, pp. 126-135). And the Annelids were described by Professor Haswell (*op. cit.* III., pp. 341-347).

A vessel of the German Navy, S.M.S. "Gazelle," circumnavigated the world on a scientific mission. She made a successful dredge haul in 76 fathoms, a few miles north of Cape Moreton, on 27th September, 1875, and procured 10 mollusca, 9 crustacea, 4 worms, and a coral ("Forschungreise Gazelle," Zool. III., 1889, pp. 262-266). An enforced stay in quarantine gave the naturalists an opportunity of searching Moreton Bay and dredging round Peel Island.

On behalf of the Australian Museum, Messrs. W. A. Haswell and A. Morton visited North Queensland in the spring of 1879, and collected round Port Denison and Holborn Island. Some of the species procured are noted by the former; crustacea (P.L.S., N.S.W., IV., pp. 403-5) and polyzoa (l.c. V., pp. 33-43, Pls. I.-IV.). Tenison-Woods dealt with a coral (l.c. V., p. 460).

The Rev. J. E. Tenison-Woods visited Port Douglas in 1879, and wrote an interesting article on the ecology of the beach of that district (P.L.S., N.S.W., V., pp. 106-131).

H.M.S. "Alert," during a cruise round the world, visited the coast of Queensland. From April to October, 1881, she examined the coast from Port Curtis to Torres Straits. Her naturalists, Dr. R. W.

Coppinger and Prof. W. A. Haswell, lost no opportunities of dredging and shore collecting. A large series of marine animals were accumulated, on which the British Museum produced a special volume. From Queensland Dr. A. Gunther identified fifty species of fish, which he refrained from cataloguing. Three new fish were described and the Australian Cephalochorda reviewed. A valuable critical account of 180 species of Mollusca was contributed by E. A. Smith. Of Echinodermata, 97 species were treated by F. Jeffrey Bell; Crustacea, 150, by E. J. Miers; Alcyonaria, 30, by S. O. Ridley; and Spongidae, 74, by the same. The Annelides taken on the Queensland coast were discussed by Haswell (P.L.S., N.S.W., VII., pp. 250-295, Pls. VI.-XI.).

Icthyology is almost the only branch of marine zoology that has attracted the notice of residents in the State. From 1882 to 1892 numerous papers on it appeared in the "Proceedings" of the Linnean Society of N. S. Wales and of the Royal Society of Queensland, from the pen of Mr. C. W. De Vis, Curator of the Queensland Museum. Since 1893 he has been succeeded in that study by Mr. J. D. Ogilby.

Prof. A. C. Haddon, who had not then forsaken zoology for the charms of anthropology, visited Torres Strait on a collecting expedition in 1888. During August and September he travelled from the Cockburn Islands and Boydong Cays in the south, *viâ* Albany Pass, Cape York, Thursday Island, Hammond Island, Wednesday Island, Jervis Island, Ormans Reef, the Brothers, and Warrior Island, to Saibai, in the north, and to Murray Island in the east. The following contributions to marine zoology resulted from his labours:—

Cephalochorda, A. Willey, Quart. Journ. Micros. Sci., XXXV., 1894, p. 361.

Mollusca, Melvill and Standen, Journ. Linn. Soc., Lond., XXVII., 1899, pp. 150-206, Pls. X.-XI; M. F. Woodward, Proc. Malac. Soc., I., 1894, p. 143; J. Thiele, Zeit. f. Weiss, Zool., LXXII., 1902, p. 249.

Crustacea, W. T. Calman, Trans. Linn. Soc., VIII., 1900, p. 1; H. Coutiere, Bull. Mus. d. hist. nat., 1900, p. 411; E. H. Carpenter, Proc. Roy. Dub. Soc., VII., p. 552-8, Pl. XXII.

Hydrometridæ, Carpenter, Proc. Roy. Dublin Soc., VII., pp. 142-146, Pls. XII.-XIII.

Corals, Haddon, Proc. Roy. Dublin Soc., VII., pp. 127-136, Pl. XI.

Hydrocorallinæ, Hickson, Proc. Roy. Dublin Soc., VII., pp. 496-510, Pl. XVIII.-XXII.

Actiniæ, Haddon and Shackleton, Sci. Trans. Roy. Soc. Dublin, IV., 1893, pp. 673-701, Pl. LXI.-LXIV., *Id.*, VI., 1898, pp. 393-498, Pls. XXII.-XXIII.

During the years 1889-90-91, the late Mr. W. Saville-Kent held office as Commissioner of Fisheries for Queensland. He studied the marine fauna with energy and enthusiasm, but his unconventional spirit did not produce the orderly and methodical work expected from a trained biologist. Various memoirs appeared as Parliamentary Reports, one on the Queensland Fishes, with figures of 65 species; others on the oyster, the pearl-shell, and the bêche-de-mer, the latter with figures of five supposed new species.

His sumptuous work on the Great Barrier Reef was apparently intended for a popular rather than for a scientific audience. In it a number of marine animals are figured, but not systematically described.

As a collector, Kent was very successful. The British Museum catalogues of the Reef Corals record 160 species brought by him from Queensland. The latter volumes of these coral catalogues are unhappily marred by the rejection of binomial nomenclature. That so staid and conservative an institution should suddenly plunge into scientific nihilism was a startling development.

It is a temptation to speculate how a memoir would be received in London if written on the British Roses by a resident of the North Pole, whose eyes had never beheld a living plant. Such study of the influence of environment on corals as the excellent work of Dr. F. W. Jones will show that with fuller knowledge the Linnean system is as applicable here as elsewhere.

Kent was succeeded by Mr. J. R. Tosh as Government Marine Biologist. He published a memoir on the Whiting of Moreton Bay (Proc. Roy. Soc. Q'land, XVII., 1903, pp. 176-184, pls. VIII.-XIV.).

Prof. Richard Semon, of Jena, visited Torres Strait in 1892. His chief object in Australian travel was the study of marsupial development, but he devoted some time to marine zoology. From 13th February to 14th April he dredged and collected around Thursday Island. The following results are published in his "Zoologische Forschungreisen":—

Prof. Max Weber names 18 Fish; Sluiter, 9 Tunicates; von Martens, 31 Mollusca; Meissner, 8 Bryozoa; Ortmann, 47 Crustacea; Sluiter, 10 Holothuria; Döderlein, 40 other Echinodermata; Fischer, 1 Gephyrean; Collin, 9 Polychæta; Kwietniewski, 2 Actinozoa; Burchardt, 8 Alcyonaria; Hentschel, 1 Gorgonia; Weltner, 7 Hydrozoa; and Schulz, a Sponge.

Prof. Alexander Agassiz chartered the s.s. "Croydon," and with Dr. W. McM. Woodworth and Mr. A. G. Mayer as assistants, examined the Queensland coast. He cruised from Breaksea Spit to Lizard Island in April and May, 1896. The coral geology is fully discussed (Bull. Mus. Comp. Zool., XXVIII., No. 4, 1898), but little seems to have been written on the fauna. *Ptychoderma australiensis*, Hill, is noted from Dunk Island (p. 124). A medusa (Agassiz and Mayer, Bull. Mus. Comp. Zool., XXXII., 1898, p. 16) and three planarians (Woodworth, *loc. cit.*, pp. 63-67, Plate) are also published.

In the years 1897-98-99, Mr. Stephen Pace was investigating the biology of the pearl-oyster on behalf of a Torres Strait shelling company. He wrote a paper on a coral (Ann. Mag. Nat. Hist. VII., 7, 1901, pp. 385-7), and another on a mollusc (Proc. Malac. Soc. IV., 1901, p. 202).

Mr. A. E. Finchk, of the Sydney University, visited Lizard Island in January-February, 1901, and made considerable zoological collections. His foraminifera were described by Messrs. Jensen and Goddard.

In July and August, 1901, Mr. E. C. Andrews and I examined the coast between Townsville and Cairns. The coral geology of the district was discussed by my friend. (P.L.S., N.S.W., XXVII., 1902, pp. 146-185). The foraminifera obtained off the Palm Islands were identified by Messrs. Jensen and Goddard (*op. cit.* XXIX., 1905, p. 827; XXXII., 1907, p. 296). Among the mollusca, especially from the Palms and Green Island, are several new and interesting forms.

As the guest of Dr. W. E. Roth, then Protector of Aborigines for Queensland, I cruised down the Gulf of Carpentaria in May and June, 1903. Opportunities occurred for dredging off Mapoon and in Van Diemen's Inlet, where interesting collections were made. Material was utilised in an article on Megalatractus (Rec. Aust. Mus., VI., 1905, pp. 98-100, Pls. XXI.-XXII.)

In October, 1904, the writer organised a party to study the southern extremity of the Barrier Reef. The point selected was Masthead Island. A large collection of crustaceæ and mollusca has been worked out (P.L.S., N.S.W., XXXI., 1906, pp. 453-479, &c.), and a few records of other groups have also appeared.

Another party was formed in August, 1906, to search the reefs off Cooktown. An essay on their structure by Mr. T. G. Taylor and myself appeared in the last volume of this Association.

Finally, Mr. A. R. McCulloch and I were despatched by the Australian Museum to collect in Torres Strait from August to October, 1907. A large zoological collection is now in course of study and publication. A new Cephalocordate (Haswell, Rec. Austr. Mus., VII., 1908, p. 33) was the first fruits of the trip.

This chronicle may be concluded by a reference to the charming book on the natural history of Dunk Island, "Confessions of a Beachcember," published by Mr. E. J. Banfield a few months since.

4.—THE FIELD FOR WORK.

The marine fauna of Queensland will provide fruitful material for the study of generations of investigators. Such work is too great for individual effort, too long for individual life. A biological survey should be organised and directed by an institution, such as a museum, a university, or a fisheries' bureau.

A few specimens, intelligently selected, properly preserved, and accompanied by field notes of habit and environment, with sketches of appearance in life, are of more service to science than great quantities of numerous species carelessly collected. For the continuity of research it is essential that types of species should not remain in private hands where they are ultimately destined to disappear or to lose their identity.

For an orderly examination our first step must be the enumeration of the species. Let preliminary catalogues of the fauna be produced, group by group. At first these lists will be imperfect through errors of omission and misidentification. They will form a target of criticism by every writer and collector. Growing better through several editions by correction and supplement, such lists may ultimately grow into systematic monographs. Then the way will be open for higher and more fascinating studies of morphology, taxonomy, and the analysis and synthesis of philosophical deduction.

"He who leads must lift," is President Roosevelt's stirring saying. That I may not seem to lay on fellow-workers a task that I would not handle myself, I now submit a preliminary list of the marine mollusca of Queensland.

While we know so little of the life of our beaches and estuaries, we, of course, know still less of the life of the deep sea. A few casts by the "Gazelle" and the "Challenger" are the only attempts made to penetrate beyond a few fathoms.

A magnificent field of research which lies at the convenience of the Queensland naturalist is the Great Barrier Reef. Here is the finest show of corals, and possibly the richest marine fauna in the world. And here, perhaps, is the best view point for considering the vexed questions of coral growth. In the Central Pacific the atolls are of great size, and separated from one another by great distances of open sea. Many are perched on the summits of huge submarine mountains, and it is questionable how their development may be distorted by the features of their foundation. But in Queensland the student may inspect rapidly and with ease innumerable miniature models of atoll growth. The small size of these admits of more intelligible survey. Their number and proximity allow an easy comparison, and the level floor on which they are based eliminates the irregularity which a mountain peak may reflect in its superincumbent atoll.

As an unworked field in ecology, I invite your attention to the mangrove swamp. The whole facies of this strange fauna and flora, which lies, as the sailors say, between wind and water, is utterly unlike that of the open sea or of fresh water. To pass in a few yards from one to the other is as great a change of scene as to travel half round the world or to step from one geological period to another.

It has been the fashion to regard a mangrove swamp as a noisome, repulsive, and unpleasant place. But I find it pretty, interesting, and attractive. Looking down from a hilltop, the mangrove swamp stretches below like some vast green meadow, and if the tide be full the green is veined with silver. Transported to the silver streak one may row up a long green lane hedged in by walls of dense and glossy foliage.

To my taste, the mangrove flora is both quaint and beautiful. A delightful recollection of bygone years is a stream winding through a glorious avenue of dwarf Nipa palms, whose lordly fronds arched over 30 ft. of water. Again, I have a picture in my mind's eye of still water, in the foreground, then an expanse of brown mud, where a litter of calling crabs have burrowed; they raise the defiant claw, and illumine the mud bank with vivid scarlet or orange patches; behind, the hedge of mangrove advancing on great stilt roots of hoops arching from a complex of great and greater hoops. Above and beyond a background of dark and glossy foliage massed like an orange grove.

In adverse climates the pioneer of the mangrove forest is Avicennia, which as a dwarfed bush struggles south to New Zealand and South Australia. Before the Queensland border is reached, first Ægiceras and then Rhizophora has joined it and going north the forest gains recruits with every few degrees of latitude.

For protection against wind and weather the mangrove forest is girt with the tough, firm-rooted Rhizophora. Behind its shelter grow the weaker trees. Where the water turns from brackish to fresh is the sweet-smelling Ægiceras. A delightful chapter in the story of this weird world is Dr. H. B. Guppy's account of the fructification of

Rhizophora. The first volume of these "Proceedings" contains an interesting article by Dr. J. Bancroft on the respiration of the roots of mangroves.

Though the order Rhizophoreæ is typical of the mangrove formation, yet many other families contribute. Mr. F. M. Bailey has kindly furnished me with the following list of the florula:—

Salomonia oblongifolia, Polygaleæ.
Calophyllum inophyllum, Guttiferæ.
Hibiscus tiliaceus, Malvaceæ.
Suriana maritima, Simarubeæ.
Carapa moluccensis, Meliaceæ.
Sophora tomentosa, Leguminoseæ.
Cynometra ramiflora ,,
Rhizophora mucronata, Rhizophoreæ.
Ceriops candolleana ,,
Bruguiera rheedii ,,
gymnorrhiza ,,
,, caryophylloides ,,
,, parviflora ,,
Carallia integerrima ,,
Lumnitzera coccinea, Combretaceæ.
Sonneratia alba, Lythrarieæ.
Samolus repens, Primulaceæ.
Ægiceras majus, Myrsineæ.
Ochrosia elliptica, Apocynaceæ.
Tournefortia argentea, Boragineæ.
Acanthus ilicifolius, Acanthaceæ.
Ægialitis annulata, Plumbagineæ.
Lippia nodifora, Verbenaceæ.
Avicennia officinalis ,,
(*See* also some Chenopodiaceous plants).
Euphorbia atoto, Euphorbiaceæ.
Actephila latifolia ,,
Excæcaria agallocha ,,
Malaisia tortuosa, Urticaceæ.
Nipa fruticans, var. neameana, Palmeæ.
Pandanus pedunculatus, Pandanaceæ.
odoratissimus ,,
Triglochin striata, Naidaceæ.

On the zoological side the lord of the swamp is the crocodile. By the creek bank it stacks its nest and lays it eggs. Banfield gives a list of the birds that haunt the mangrove swamp.

Among fish, the curious Periopthalmus is everywhere conspicuous. The smaller, *P. Koelreuteri*, is generally distributed, but the larger, *P. australis*, is confined to the north. By its partiality to the swamps *Mugil dobula* has earned the name of "Mangrove Mullet."

In the muddy pools lies Balanoglossus. When stirred up, it appears for an instant as a primrose-yellow worm, and then immediately buries itself again.

Among crustacea the calling crabs are the first to catch the eye. Mr. A. R. McCulloch tells me that there are many species of Uca in Queensland. At Port Curtis he finds the common species to be

U. dussumieri and *U. arcuata*, but at Cooktown *U. marionis, var. nitida*. Another burrowing crab is *Sesarma bidens*. The active *Metopograpsus messor* darts over the ground and climbs among the roots. The hermit crabs are numerous among the mangroves. Far above the tide mark swarm Cœnobita; *C. spinosa, var. olivieri*, and *C. rugosa*. Globose shells, such as Neritina and Natica, are the favourite apartment for *Clibanarius virescens*, while *C. padavensis* is partial to the more elongate Telescopium shells.

High up among the mangrove branches roost several marine molluscs of the genera Litorina, Cerithidea, &c. On the roots cluster the oyster, and here will be detected by some conchologist more fortunate than myself the strange *Ænigma ænigmatica*. Among the roots crawl a variety of gasteropods, ranging downward in size from the great Telescopium and its relations of the Cerithiidæ. The Auriculacea *Nerita*, *Onchidium* and *Stenothyra*, are characteristic of this zone. The large Cyrena is a common form; *Lucina corrugata* and some of the Tellinidæ represent the bivalves.

In conclusion, I will express the hopes that the study of the Marine Fauna will not be left to visitors and foreigners, but that Queensland's own children will take up this fascinating subject; that their Biological Station may be soon established; that the Queensland Museum may be enlarged and more liberally endowed; and that from the promised university there may flow an ever-increasing stream of knowledge.

APPENDIX.

CATALOGUE OF THE MARINE MOLLUSCA OF QUEENSLAND.

No Catalogue of the Marine Mollusca of Queensland has yet been compiled. The following list is merely preliminary, and any serious effort would greatly enlarge it. In 1888 Professor Tate estimated the marine mollusca from tropical Australia at 1,500; now more than 1,800 are known from Queensland alone. But Hidalgo calculates the marine mollusca of the Philippine Archipelago at over 3,000. The marine mollusca of the Japanese Empire amount to nearly as many. The fauna of the Australian tropics will probably prove comparable with these.

The addition of the author, date and original genus to the name, will enable students to recover the original description at a single consultation. Sherborn's invaluable Index Animalium is the readiest means of tracing the older species. If earlier than 1835, Deshayes' edition of the Animaux sans vertebres will probably contain the species. If the date be later than 1864, the Zoological Record will be the most convenient guide. Between 1835 and 1864 most entries may be found in the decennial indexes of the Zoological Society's Proceedings. Sykes' Digesta Malacologia may also be consulted with advantage.

PELECYPODA.

Nucula loringi, Adams and Angas, 1863
  simplex, A. Adams, 1856
  superba, Hedley, 1902
  torresi, Smith, 1885
Leda corbuloides, Smith, 1885
  crassa, Hinds, 1843; *Nucula*
  darwini, Smith, 1884
  neariformis, Smith, 1885
  novae-guineensis, Smith, 1885
  watsoni, Smith, 1885
Cucullaea concamera, Bruguiere, 1789

Limopsis loringi, Angas, 1873
macgillivrayi, A. Adams, 1862
multistriatus, Forskal, 1775; *Arca*
torresi, Smith, 1885
Arca afra, Gmelin, 1791
antiquata, Linne, 1758
clathrata, Reeve, 1844
corpulenta, Smith, 1885
dautzenbergi, Lamy, 1907
decussata, Sowerby, 1833; *Byssoarca*
disparilis, Reeve, 1844
fasciata, Reeve, 1844
foliata, Forskäl, 1775
fusca, Bruguière, 1792
granosa, Linne, 1758
imbricata, Bruguière, 1792
lateralis, Reeve, 1844
navicularis, Bruguière, 1792
pilula, Reeve, 1844
plicata, Chemnitz, 1795
semitorta, Lamarck, 1819
tenebrica, Reeve, 1844
tenella, Reeve, 1844
tortuosa, Linne, 1758
trapezia, Deshayes, 1839
ventricosa, Lamarck, 1819
wendti, Lamy, 1907
Glycymeris capricornea, Hedley, 1906
cardiiformis, Angas, 1879; *Pectunculus*
crebriliratus, Sowerby, 1886; *Pectunculus*
fringilla, Angas, 1872; *Axinæa*
pectunculus, Linne, 1758; *Arca*
queenslandica, Hedley, 1906
tenuicostatus, Reeve, 1843; *Pectunculus*
vitreus, Lamarck, 1819; *Pectunculus*
Philobrya scabra, Hedley, 1906
recapitula, Hedley, 1906
Pinna assimilis, Reeve, 1858
fumata, Reeve, 1858
nigra, Dillwyn, 1817
serrata, Sowerby, 1825
stutchburii, Reeve, 1858
vexillum, Born, 1778
Perna attenuata, Reeve, 1858
isognomum, Linne, 1758; *Ostrea*
lentiginosa, Reeve, 1858
Melina cumingii, Reeve, 1858; *Perna*
Crenatula flammea, Reeve, 1858
picta, Gmelin, 1791; *Ostrea*
Pteria ala-corvi, Chemnitz
aquatilis, Reeve, 1857; *Avicula*
crocea, Chemnitz
lata, Gray, 1845; *Avicula*
macroptera, Lamarck, 1819; *Avicula*
malleoides, Reeve, 1857; *Avicula*
muricata, Reeve, 1857; *Avicula*
rufa, Dunker, 1848; *Avicula*
smaragdina, Reeve, 1857; *Avicula*
zebra, Reeve, 1857; *Avicula*
Meleagrina anomioides, Reeve, 1857; *Avicula*
flexuosa, Reeve, 1857; *Avicula*
lucunata, Reeve, 1857; *Avicula*
margaritifera, Linne, 1758; *Mytilus*
maxima, Jameson, 1901; *Margaritifera*
sugillata, Reeve, 1857; *Avicula*
tegulata, Reeve, 1857; *Avicula*

Malleus albus, Lamarck, 1819
    legumen, Reeve, 1858
    malleus, Linne, 1758; *Ostrea*

Vulsella vulsella, Linne, 1758; *Mya*

Ostrea cerata, Sowerby, 1871
    cristagalli, Linne, 1758; *Mytilus*
    cucullata, Born, 1778
    imbricata, Lamarck, 1819
    nigromarginata, Sowerby, 1871
    tuberculata, Lamarck, 1804

Trigonia uniophora, Gray, 1847

Pecten medius, Lamarck, 1819

Chlamys crassicostatus, Sowerby, 1842; *Pecten*
    crouchi, Smith, 1892
    cruentatus, Reeve, 1853; *Pecten*
    cuneatus, Reeve, 1853; *Pecten*
    dringi, Reeve, 1853; *Pecten*
    flabellatus, Lamarck, 1819; *Pecten*
    fricatus, Reeve, 1853; *Pecten*
    funebris, Reeve, 1853; *Pecten*
    lemniscatus, Reeve, 1853; *Pecten*
    lentiginosus, Reeve, 1853; *Pecten*
    limatula, Reeve, 1853; *Pecten*
    lividus, Lamarck, 1819; *Pecten*
    madreporarum, Sowerby, 1847; *Pecten*
    maldivensis, Smith, 1904
    pallium, Linne, 1758; *Ostrea*
    pseudolima, Sowerby, 1842; *Pecten*
    pulchella, Reeve, 1853; *Pecten*
    senatorius, Gmelin, 1791; *Ostrea*
    singaporinus, Sowerby, 1842; *Pecten*
    strangei, Reeve, 1852; *Pecten*

Amusium scitulum, Smith, 1885
    pleuronectes, Linne, 1758; *Ostrea*
    torresi, Smith, 1885

Cyclopecten murrayi, Smith, 1885; *Pecten*

Spondylus barbatus, Reeve, 1856
    foliaceus, Chemnitz
    hystrix, Reeve, 1856
    multisetosus, Reeve, 1856
    nicobaricus, Chemnitz
    pacificus, Reeve, 1856
    tenebrosus, Reeve, 1856
    tenuispinosus, Sowerby, 1847
    victoriae, Sowerby, 1859
    zonalis, Lamarck, 1819

Plicatula australis, Lamarck, 1819
    imbricata, Menke, 1843

Lima angulata, Sowerby, 1843
    arcuata, Sowerby, 1843
    alata, Hedley, 1898
    bullata, Born, 1778; *Ostrea*
    fasciata, Linne, 1758; *Ostrea*
    inflata, Lamarck, 1819
    lima, Linne, 1758; *Ostrea*
    linguatula, Lamarck, 1819
    tenera, Chemnitz

Limea torresiana, Smith, 1885; *Limatula*

Patro elyros, Gray, 1849; *Anomia*

Placunanomia ione, Gray, 1850

Ænigma ænigmatica, Chemnitz; *Tellina*

Placenta placenta, Linne, 1758; *Anomia*
    lobata, Sowerby, 1871

Brachyodontes curvatus, Dunker, 1857; *Mytilus*
    hirsutus, Lamarck, 1819; *Mytilus*
Modiola arborescens, Chemnitz, 1795; *Mytilus*
    auriculata, Krauss, 1848
    australis, Gray, 1827
    lignea, Reeve, 1858
    philippinarum, Hanley, 1844
Stavelia horrida, Dunker, 1857; *Mytilus*
Lithophaga canalifera, Hanley, 1844
    cinnamomea, Lamarck, 1819; *Modiola*
    corrugata, Philippi, 1846; *Modiola*
    gracilis, Philippi, 1846; *Modiola*
    hanleyana, Reeve, 1857; *Lithodomus*
    laevigata, Quoy and Gaimard, 1835; *Modiola*
    straminea, Reeve, 1857; *Lithodomus*
    teres, Philippi, 1846; *Modiola*
Modiolaria barbata, Reeve, 1858; *Lithodomus*
    cumingiana, Reeve, 1857; *Modiola*
    cuneata, Gould, 1861
    miranda, Smith, 1884
    perstriata, Hedley, 1906
    splendida, Dunker, 1856; *Volsella*
Myrina coppingeri, Smith, 1885
Congeria lunata, Hedley, 1902
Septifer bilocularis, Linne, 1758; *Mytilus*
Julia exquisita, Gould, 1862
Pholadomya arenosa, Hedley, 1904; *Thraciopsis*
    haddoni, Melvill and Standen, 1899
Anatina faba, Reeve, 1863
    gracilis, Reeve, 1860
    prolongata, Reeve, 1863
    vagina, Reeve, 1863
Thracia modesta, Angas, 1867
Thraciopsis speciosa, Angas, 1869; *Thracia*
Myochama anomioides, Stutchbury, 1830
Myodora australica, Reeve, 1859; *Thracia*
    brevis, Sowerby; *Pandora*
    pulleinei, Hedley, 1906
    trigona, Reeve
Cœlodon elongatus, Carpenter, 1846
Clavagella torresi, Smith, 1885
Aspergillum agglutinans, Lamarck, 1818
    strangulatum, Chenu
Verticordia australiensis, Smith, 1885
    deshayesiana, Fischer, 1862
    torrida, Hedley, 1906
Poromya australis, Smith, 1885
    lævis, Smith, 1885
Cuspidaria brazieri, Smith, 1885; *Neæra*
    fallax, Smith, 1885; *Neæra*
    latesulcata, Ten. Woods, 1878; *Neæra*
Trapezium angulatum, Lamarck, 1819; *Cypricardia*
    vellicatum, Reeve, 1843; *Cypricardia*
Crassatellites janus, Hedley, 1906
    kingicola, Lamarck, 1804; *Crassatella*
    rhomboides, Smith, 1885; *Crassatella*
    torresi, Smith, 1885; *Crassatella*
    ziczac, Reeve; *Crassatella*
Cuna delta, Tate and May, 1900; *Carditella*
    flava, Hedley, 1906
Cyrena coaxans, Gmelin, 1791; *Venus*
Batissa triquetra, Deshayes, 1854
Carditella torresi, Smith, 1885
    infans, Smith, 1885

- Cardita calyculata, Linne, 1758; *Chama*
  - cardioides, Reeve, 1843
  - crassicosta, Lamarck, 1819
  - incrassata, Sowerby, 1825
  - insignis, Smith, 1885
  - marmorea, Reeve, 1843
  - semiorbiculata, Linne, 1758; *Chama*
  - variegata, Bruguière, 1792
- Venericardia amabilis, Deshayes, 1854
- Condylocardia ovata, Hedley, 1906
  - porrecta, Hedley, 1906
  - trifoliata, Hedley, 1906
- Chama divaricata, Reeve, 1846
  - fimbriata, Reeve, 1847
  - jukesii, Reeve, 1847
  - pulchella, Reeve, 1846
  - reflexa, Reeve, 1846
  - spinosa, Broderip, 1835
  - sulphurea, Reeve, 1846
- Codakia bella, Conrad, 1837; *Lucina*
  - congenita, Smith, 1885; *Lucina*
  - cristata, Smith, 1885; *Lucina*
  - exasperata, Reeve, 1850; *Lucina*
  - interrupta, Lamarck, 1818; *Cytherea*
  - munda, A. Adams, 1856; *Lucina*
  - oblonga, Hedley, 1899; *Lucina*
  - reevei, Deshayes, 1863; *Lucina*
  - strangei, A. Adams, 1856; *Lucina*
- Loripes haddoni, Melvill and Standen, 1899
  - icterica, Reeve, 1850; *Lucina*
- Phacoides eucosmia, Dall, 1901; *Parvilucina*
- Myrtæa desiderata, Smith, 1885; *Lucina*
- Divaricella angulifera, v. Martens, 1880; *Lucina*
  - macandreæ, H. Adams, 1870; *Lucina*
- Corbis fimbriata, Linne, 1758; *Venus*
  - elegans, Deshayes
- Diplodonta adamsi, Angas, 1867; *Mysia*
  - conspicua, Smith, 1885
  - corpulenta, Smith, 1885
  - ethima, Melvill and Standen, 1899
  - globosa, A. Adams, 1856
  - scalpta, Smith, 1885
  - subcrassa, Smith, 1884
  - subglobosa, Smith, 1885
  - sublateralis, Smith, 1885
- Joannisiella sphaericula, Deshayes, 1855; *Cyrenella*
  - moretonensis, Deshayes, 1855; *Cyrenella*
- Lucina corrugata, Deshayes, 1843
  - edentula, Linne, 1758; *Venus*
- Kellia cycladiformis, Deshayes, 1850
  - physema, Melvill and Standen, 1899
  - suborbicularis, Montagu, 1804; *Mya*
- Rochefortia acuminata, Smith, 1885; *Montacuta*
  - ephippiolum, Melvill and Standen, 1899; *Tellimya*
  - paula, A. Adams, 1856; *Pythina*
- Cyamiomactra mactroides, Tate and May, 1900; *Cyamium*
- Solecardia alberti, Smith, 1884; *Scintilla*
  - aurantiaca, Deshayes, 1856; *Scintilla*
  - cuvieri, Deshayes, 1856; *Scintilla*
  - hyalina, Deshayes, 1856; *Scintilla*
  - purpurascens, Sowerby, 1874; *Scintilla*
  - strangei, Deshayes, 1856; *Scintilla*
  - turgescens, Deshayes, 1856; *Scintilla*
- Galeomma denticulata, Deshayes, 1863

- Cardium bechei, Reeve, 1847
  - biradiatum, Bruguière, 1789
  - dianthinum, Melvill and Standen, 1899
  - dupuchense, Reeve, 1845
  - elongatum, Bruguière, 1789
  - flavum, Linne, 1758
  - fornicatum, Sowerby, 1841
  - fragum, Linne, 1758
  - hemicardium, Linne. 1758
  - hystrix, Reeve, 1844
  - imbricatum, Sowerby, 1841
  - laevigatum, Linne, 1758
  - lacunosum, Reeve, 1845
  - lobulatum, Deshayes, 1855
  - lyratum, Sowerby, 1841
  - maculosum, Wood, 1815
  - multispinosum, Sowerby, 1840
  - productum, Deshayes, 1855
  - reevianum, Dunker, 1852
  - rubicundum, Reeve, 1844
  - serricostatum, Melvill and Standen, 1899
  - skeeti, Hedley, 1906
  - tenuicostatum, Lamarck, 1819
  - transcendens, Melvill and Standen, 1899
  - unedo, Linne, 1758
  - variegatum, Sowerby, 1841
- Opisocardium subretusum, Sowerby, 1841; *Cardium*
- Tridacna crocea, Lamarck, 1819
  - derasa, Bolten, 1798; *Tridachnes*
  - elongata, Lamarck, 1819
  - gigas, Linne, 1758; *Chama*
  - lamarcki, Hidalgo, 1903
- Hippopus hippopus, Linne, 1758; *Chama*
- Dosinia amphidesmoides, Reeve, 1850; *Artemis*
  - cærulea, Reeve, 1850; *Artemis*
  - deshayesii, A. Adams, 1856
  - exasperata, Philippi, 1847; *Cytherea*
  - histrio, Gmelin, 1791; *Venus*
  - nobilis, Deshayes, 1853
  - sculpta, Hanley, 1856; *Artemis*
  - tumida, Gray, 1838; *Artemis*
- Clementia papyracea, Gray, 1825; *Venus*
- Gafrarium angasi, Smith, 1885; *Circe*
  - australe, Sowerby, 1851; *Circe*
  - australica, Reeve, 1863; *Dione*
  - bullatum, Sowerby, 1851; *Cytherea*
  - coxeni, Smith, 1884; *Cytherea*
  - inflatum, Sowerby, 1856; *Cytherea*
  - jucundum, Smith, 1885; *Circe*
  - lenticulare, Deshayes, 1854; *Cytherea*
  - navigatum, Hedley, 1906
  - obliquissimum, Smith, 1885; *Circe*
  - pectinatum, Linne, 1758; *Venus*
  - rivulare, Born, 1778; *Venus*
  - scriptum, Linne, 1758; *Venus*
  - tumidum, Bolten, 1789
  - yerburyi, Smith, 1891; *Cytherea*
- Cytherea anadyomene, Anton, 1839; *Venus*
  - calophylla, Philippi, 1836; *Venus*
  - capricornea, Hedley, 1908; *Chione*
  - chemnitzii, Hanley, 1845; *Venus*
  - embrithes, Melvill and Standen, 1899; *Chione*
  - foliacea, Philippi, 1846; *Venus*
  - lamellaris, Schumacher, 1817; *Antigona*
  - laqueata, Sowerby, 1853; *Venus*

- Cytherea lionota, Smith, 1885; *Venus*
  - listeri, Gray, 1838; *Dosinia*
  - puerpera, Linne, 1771; *Venus*
  - reticulata, Linne, 1758; *Venus*
  - tiara, Dillwyn, 1817; *Venus*
  - toreuma, Gould, 1850; *Venus*
  - torresiana, Smith, 1884; *Venus*
- Lioconcha castrensis, Linne, 1758; *Venus*
  - fastigiata, Sowerby, 1851; *Cytherea*
  - ornata, Dillwyn, 1817; *Venus*
- Granicorium indutum, Hedley, 1906
- Macrocallista disrupta, Sowerby, 1853; *Cytherea*
  - hebraea, Lamarck, 1818; *Cytherea*
  - roseotincta, Smith, 1885; *Cytherea*
- Chione costellifera, A. Adams, 1850; *Venus*
  - infans, Smith, 1885
  - marica, Linne, 1758; *Venus*
  - phoenicopterus, Romer, 1869; *Caryatis*
  - recognita, Smith, 1885; *Venus*
  - regularis, Smith, 1885; *Cytherea*
  - scabra, Hanley, 1845; *Venus*
  - semperi, Dunker, 1871
  - subnodulosa, Hanley, 1845; *Venus*
  - torresica, Reeve, 1863
  - undulosa, Lamarck, 1819; *Venus*
- Pitaria prora, Conrad, 1837; *Cytherca*
- Paphia deshayesi, Hanley, 1856; *Venus*
  - gallus, Gmelin, 1791; *Venus*
  - hiantina, Lamarck: *Venus*
  - literata, Linne, 1758; *Venus*
  - radiata, Chemnitz
  - sulcosa, Philippi, 1847; *Venus*
  - textile, Gmelin, 1791; *Venus*
  - tristis, Lamarck, 1818; *Venus*
  - variegata, Sowerby, 1852; *Tapes*
- Petricola lapicida, Gmelin, 1791; *Venus*
- Isocardia moltkiana, Gmelin, 1791; *Chama*
- Glaucomya rugosa, Hanley, 1828; *Glauconomya*
  - desmoyersii, Reeve
- Tellina asperrima, Hanley, 1844
  - aurea, Perry, 1811
  - australis, Deshayes, 1855
  - capsoides, Lamarck, 1818
  - compacta, Smith, 1885
  - decussata, Lamarck, 1818
  - diluta, Smith, 1885
  - dispar, Conrad, 1837
  - donaciformis, Deshayes, 1855
  - emarginata, Sowerby, 1825
  - gargadia, Linne, 1758
  - inflata, Gmelin, 1791
  - iridescens, Benson, 1842; *Sanguinolaria*
  - languida, Smith, 1885
  - lux, Hanley, 1844
  - murrayi, Smith; 1885
  - perna, Spengler, 1798
  - pharaonis, Hanley, 1844
  - philippinarum, Hanley, 1844
  - philippii, Philippi, 1844
  - pulcherrima, Sowerby, 1825
  - procrita, Melvill and Standen, 1899
  - remies, Linne, 1758
  - rhomboides, Quoy and Gaimard, 1835
  - rugosa, Born, 1780
  - semen, Hanley, 1845

Tellina] semitorta, Sowerby, 1867
solenella, Deshayes, 1855
staurella, Lamarck, 1818
squamulosa, A. Adams, 1850
subtruncata, Hanley, 1844
sulcata, Wood, 1815
tenuilirata, Sowerby, 1867
vernalis, Hanley, 1844
virgata, Linne, 1758
virgulata, Hanley, 1845
Macoma inequivalvis, Sowerby, 1867; *Tellina*
candida, Lamarck, 1818; *Psammotœa*
moretonensis, Deshayes, 1855; *Tellina*
Arcopagia casta, Hanley, 1844; *Tellina*
angulata, Linne, 1767; *Tellina*
carnicolor, Hanley, 1846; *Tellina*
elegantissima, Smith, 1885; *Tellina*
fabrefacta, Pilsbry, 1904; *Tellina*
lingua-felis, Linne, 1758; *Tellina*
ovata, Bolten, 1798; *Tellina*
pinguis, Hanley, 1844; *Tellina*
robusta, Hanley, 1844; *Tellina*
savignyi, H. Adams, 1870; *Tellina*
scobinata, Linne, 1758; *Tellina*
tessellata, Deshayes, 1855; *Tellina*
Metis meyeri, Philippi, 1846; *Tellina*
spectabilis, Hanley, 1844; *Tellina*
Strigilla euronia, Hedley, 1908
grossiana, Hedley, 1908
splendida, Anton, 1839; *Tellina*
Phylloda foliacea, Linne, 1758; *Tellina*
Semele amabilis, Reeve, 1853; *Amphidesma*
casta, Reeve, 1853; *Amphidesma*
crenata, Adams and Angas, 1863
crenulata, Reeve, 1853; *Amphidesma*
duplicata, Sowerby, 1830
exarata, Adams and Reeve, 1850
infans, Smith, 1885
jukesii, Reeve, 1853; *Amphidesma*
lamellosa, Sowerby, 1830
regularis, Smith, 1885
Theora fragilis, A. Adams, 1856; *Neœra*
Leptomya psittacus, Hanley, 1883
Abra truncata, Hedley, 1906
Psammobia anomala, Deshayes, 1855
castrensis, Spengler, 1794; *Solen*
gracilenta, Smith, 1884
lessoni, Blainville, 1826
marmorea, Deshayes, 1855
modesta, Deshayes, 1855
ornata, Deshayes, 1855
praestans, Deshayes, 1855
pulcherrima, Deshayes, 1855
rasilis, Melvill and Standen, 1899
zonalis, Lamarck, 1818; *Psammotœa*
Sanguinolaria virescens, Deshayes, 1855; *Capsa*
tenuis, Deshayes, 1855; *Capsa*
Asaphis deflorata, Linne, 1758; *Venus*
contraria, Deshayes, 1863; *Psammobia*
Donax deltoides, Lamarck, 1818
brazieri, Smith, 1891
faba, Gmelin, 1791
nitida, Reeve, 1854
Cultellus cultellus, Linne, 1758; *Solen*
hanleyi, Dunker, 1861

Psammosolen australis, Dunker, 1861; *Macha*
coarctatus, Gmelin, 1791; *Solen*
deshayesii, Dunker, 1861; *Macha*
minutus, Dunker, 1861; *Azor*
sulcatus, Dunker, 1861; *Macha*
Mactra achatina, Chemnitz, 1795
angulifera, Reeve, 1854
apicina, Reeve, 1854
aspersa, Sowerby, 1825
coppingeri, Smith, 1884
dissimilis, Reeve, 1854
eximia, Reeve, 1854
jacksonensis, Smith, 1885
maculata, Gmelin, 1791
obesa, Reeve, 1854
ornata, Gray, 1837
parkesiana, Hedley, 1902
plicataria, Linne, 1767
pusilla, A. Adams, 1856
tristis, Reeve, 1854
Spisula parva, Petit, 1853; *Gnathodon*
Labiosa grayi, H. Adams, 1872; *Raeta*
Lutraria arcuata, Reeve, 1854
elongata, Gray, 1837
impar, Reeve, 1854
oblonga, Gmelin, 1791; *Mya*
philippinarum, Reeve, 1854
Standella nicobarica, Gmelin, 1791; *Mactra*
Cardilia semisulcata, Lamarck, 1819; *Isocardia*
Atactodea glabrata, Gmelin, 1791; *Mactra*
intermedia, Reeve, 1854; *Mesodesma*
mitis, Reeve, 1854; *Mesodesma*
striata, Gmelin, 1791; *Mactra*
Mesodesma elongata, Reeve, 1854
Davila plana, Hanley, 1843; *Mesodesma*
Ervilia bisculpta, Gould, 1861
Cryptomya elliptica, A. Adams, 1851; *Sphaenia*
Corbula crassa, Hinds, 1843
macgillivrayi, Smith, 1885
monilis, Hinds, 1843
scaphoides, Hinds, 1843
taitensis, Lamarck, 1818
tunicata, Hinds, 1843
Saxicava arctica, Linne, 1767; *Mya*
Anisodonta caledonica, Fischer, 1886; *Eucharis*
Gastrochaena hians Gmelin, 1791; *Pholas*
gigantea, Deshayes, 1830; *Fistulana*
plicatilis, Deshayes, 1855
Roccellaria pupina, Deshayes, 1855; *Gastrochaena*
Pholas quadrizonata, Spengler, 1792
latissima, Sowerby, 1849
orientalis, Gmelin, 1791
australasiæ, Sowerby, 1849
obturamentum, Hedley, 1893
multistriata, Sowerby, 1849
Martesia obtecta, Sowerby, 1849; *Pholas*
striata, Linne, 1758; *Pholas*
Jouanetia cumingi, Sowerby, 1849
globosa, Q. and G., 1832
Fistulana mumia, Spengler, 1783; *Gastrochaena*
Solen sloanii, Hanley, 1842
vagina, Linne, 1758
Nausitoria manni, Wright, 1865
thoracites, Gould, 1856, *Calobates*

CEPHALOPODA.

Nautilus pompilius, Linne, 1758
Spirula spirula, Linne, 1758; *Nautilus*
Sepia cultrata, Hoyle, 1885
  esculenta, Hoyle, 1886
  pfefferi, Hoyle, 1885
Sepioteuthis lessoniana, Ferussac, 1826
Ommastrephes oualaniensis, Lesson, 1830
Polypus pictus, Brock, 1882; *Octopus*
  polyzenia, Gray, 1849; *Octopus*
  tenebricus, Smith, 1884; *Octopus*
Argonauta hians, Dillwyn, 1817

AMPHINEURA.

Notomenia clavigera, Thiele, 1897
Proneomenia australis, Thiele, 1897
Ischnochiton adelaidensis, Reeve, 1847; *Chiton*
  australis, Sowerby, 1840; *Chiton*
Callistochiton antiquus, Reeve, 1847; *Chiton*
Acanthochites asbestoides, Smith, 1884; *Chiton*
Cryptoplax burrowi, Smith, 1884; *Chiton*
  oculatus, Quoy and Gaim, 1834; *Chiton*
Chiton miles, Pilsbry, 1892
  translucens, Hedley and Hull, 1909
  pulcherrimus, Sowerby, 1841
Tonicia confossa, Gould, 1846; *Chiton*
  fortilirata, Reeve, 1847; *Chiton*
  picta, Reeve, 1847; *Chiton*
Liolophura curtisiana, Smith, 1884; *Chiton*
  gaimardi, var. queenslandica, Pilsbry, 1894
Acanthopleura aculeata, Linne, 1758; *Chiton*
  spinosa, Bruguière, 1792; *Chiton*
Schizochiton incisus, Sowerby, 1841; *Chiton*
Onithochiton lyellii, Sowerby, 1832; *Chiton*

GASTEROPODA.

Schismope atkinsoni, Ten-Woods, 1877; *Scissurella*
Scutus unguis, Linne, 1758; *Patella*
Subemarginula cumingii, Sowerby, 1863; *Emarginula*
  clathrata, Ad. and Reeve, 1850; *Emarginula*
  rugosa, Quoy and Gaim, 1833; *Emarginula*
Emarginula convexa, Hedley, 1907
  dilecta, A. Adams, 1852
  incisura, A. Adams, 1852
  micans, A. Adams, 1852
  variegata, A. Adams, 1852
Megatebennus javanicensis, Lamarck, 1822; *Fissurella*
Fissuridea corbicula, Sowerby, 1862; *Fissurella*
  galeata, Helbling, 1779; *Patella*
  incii, Reeve, 1850; *Fissurella*
  jukesii, Reeve, 1849; *Fissurella*
  proxima, Sowerby, 1862; *Fissurella*
  quadriradiata, Reeve, 1850; *Fissurella*
  rüppellii, Sowerby, 1835; *Fissurella*
  singaporensis, Reeve, 1850; *Fissurella*
  ticaonica, Reeve, 1850; *Fissurella*
Fissurella calyculata, Sowerby, 1823
  elongata, Philippi, 1845
  lanceolata, Sowerby, 1862
  minuta, Lamarck, 1822
  octagona, Reeve, 1850
Macroschisma madreporaria, Hedley, 1907
Lucapinella nigrita, Sowerby, 1834; *Fissurella*
Zeidora lodderæ, Tate and May, 1900
Rimula exquisita, A. Adams, 1853

Puncturella galerita, Hedley, 1902
Haliotis asinina, Linne, 1758
astricta, Reeve, 1846
ovina, Gmelin, 1791
squamata, Reeve, 1846
varia, Linne, 1758
Microtis tuberculata, A. Adams, 1850
Stomatella bicarinata, A. Adams, 1854; *Stomatia*
biporcata, A. Adams, 1850
cancellata, Krauss, 1848
concinna, Gould, 1845
elegans, Gray, 1847
imbricata, Lamarck, 1822
maculata, Quoy and Gaimard, 1834
orbiculata, A. Adams, 1850
rufescens, Gray, 1847
stellata, Souverbie, 1863
sulcifera, Lamarck, 1822
Stomatia angulata, A. Adams, 1850
australis, A. Adams, 1850
decussata, A. Adams, 1850
phymotis, Helbling, 1779
Gena lentricula, A. Adams, 1850
striatula, A. Adams, 1850
ungula, Hedley, 1907
varia, A. Adams, 1850
Trochus calcaratus, Souverbie, 1875
fenestratus, Gmelin, 1791
hexagonus, Philippi, 1846
maculatus, Linne, 1758
niloticus, Linne, 1767
obeliscus, Gmelin, 1791
Clanculus albinus, A. Adams, 1853
atropurpureus, Gould, 1849; *Trochus*
bicarinatus, Angas, 1880
granti, Hedley, 1907
stigmatarius, A. Adams, 1853
unedo, A. Adams, 1853
Camita rotellina, Gould, 1860; *Trochus*
Monodonta labio, Linne, 1758; *Trochus*
millelineatus, Bonnet, 1864; *Trochus*
viridis, Lamarck, 1822
Cantharidus crenelliferus, A. Adams, 1853; *Thalotia*
cingulatus, A. Adams, 1863; *Leiopyrga*
eximius, Perry, 1811; *Bulimus*
marginatus, Ten.-Woods, 1880; *Thalotia*
suturalis, A. Adams, 1853; *Thalotia*
Gibbula maccullochi, Hedley, 1907
townsendi, Sowerby, 1895
Monilea callifera, Lamarck, 1822; *Trochus*
glaphyrella, Melvill and Standen, 1895; *Minolia*
henniana, Melvill, 1891; *Minolia*
lentiginosa, A. Adams, 1852
lifuana, Fischer, 1878; *Trochus*
nuclea, Philippi, 1849; *Trochus*
pudibunda, Fischer, 1878; *Trochus*
tropicalis, Hedley, 1907
vitiliginea, Menke, 1843; *Trochus*
Calliostoma arruense, Watson, 1880; *Trochus*
bicingulatus, Lamarck, 1822; *Trochus*
deceptum, Smith, 1899
monile, Reeve, 1863; *Ziziphinus*
nobile, Philippi, 1846; *Trochus*
polychroma, A. Adams, 1853; *Ziziphinus*
scobinatum, Reeve, 1863; *Ziziphinus*

- Calliostoma similare, Reeve, 1863; *Ziziphinus*
  - speciosum, A. Adams, 1855; *Ziziphinus*
  - trepidum, Hedley, 1907
- Astele septenarium, Melv. Stand., 1899; *Calliostoma*
- Turcia maculata, Brazier, 1877; *Thalotia*
  - monilifera, A. Adams, 1855
  - montrouzieri, Fischer, 1878; *Tectaria*
- Basilissa superba, Watson, 1879
- Euchelus atratus, Gmelin, 1791; *Trochus*
  - foveolatus, A. Adams, 1853; *Monodonta*
  - granosus, Brazier, 1877; *Clanculus*
  - roseola, Nevill, 1869; *Tallorbis*
  - rubus, A. Adams, 1853; *Monodonta*
- Angaria delphinus, Linne, 1758; *Turbo*
  - formosa, Reeve, 1842; *Delphinula*
- Umbonium vestiarium, Linne, 1758; *Trochus*
- Ethalia guamensis, Quoy and Gaimard, 1834; *Rotella*
  - pulchella, A. Adams, 1855; *Isanda*
- Isanda coronata, A. Adams, 1855
- Chrysostoma paradoxum, Born, 1780; *Helix*
- Alcyna australis, Hedley, 1907
- Phasianella variegata, Lamarck, 1822
- Turbo argyrostomus, Linne, 1758
  - concinnus, Philippi, 1847
  - chrysostomus, Linne, 1758
  - foliaceus, Philippi, 1846
  - gemmatus, Reeve, 1848
  - imperialis, Gmelin, 1791
  - marmoratus, Linne, 1758
  - nivosus, Reeve, 1848
  - petholatus, Linne, 1758
  - porphyrites, Martyn, 1784; *Helix*
  - sparverius, Gmelin, 1791
  - speciosus, Reeve, 1848
  - tumidulus, Reeve, 1848
  - undulatus, Martyn, 1784; *Limax*
- Astralium petrosum, Martyn, 1787; *Trochus*
  - nobile, Gray, 1847
  - aureum, Hedley, 1907
  - tentoriiforme, Jonas, 1845; *Trochus*
- Callomphala globosa, Hedley, 1901
  - lucida, Adams and Angas, 1864; *Neritula*
- Teinostoma involutum, Hedley, 1902
  - oppletum, Hedley, 1898
  - orbitum, Hedley, 1900
  - qualum, Hedley, 1899
  - vestum, Hedley, 1901
- Cirsonella weldii, Tenison-Woods, 1877; *Cyclostrema*
  - cubitale, Hedley, 1907
- Liotia acidalia, Melvill and Standen, 1899; *Microtheca*
  - calliglypta, Melvill, 1891
  - crenata, Kiener, 1839; *Delphinula*
  - corona, Hedley, 1902
  - devexa, Hedley, 1901
  - discoidea, Reeve, 1843; *Delphinula*
  - incidata, Hedley, 1902
  - latebrosa, Hedley, 1907
  - micans, A. Adams, 1850; *Cyclostrema*
  - minima, Tenison-Woods, 1878
  - muricata, Reeve, 1843; *Delphinula*
  - peronii, Kiener, 1839; *Delphinula*
  - philtata, Hedley, 1900
  - rostrata, Hedley, 1900
  - scalaroides, Reeve, 1843; *Delphinula*
  - varicosa, Reeve, 1843; *Delphinula*
  - venusta, Hedley, 1901

Mecoliotia spinosa, Hedley, 1902
Moerchia introspecta, Hedley, 1907
Leptothyra laeta, Montrouzier, 1863; *Turbo*
nanina, Souverbie, 1864; *Turbo*
Nerita albicilla, Linne, 1758
chamaeleon, Linne, 1758
costata, Gmelin, 1791
grossa, Linne, 1758
insculpta, Recluz, 1841
lineata, Gmelin, 1791
melanotragus, Smith, 1884
planospira, Anton, 1839
plicata, Linne, 1758
polita, Linne, 1758
reticulata, Karsten, 1789
undata, Linne, 1758
Magadis eumerintha, Melvill and Standen, 1899
Neritina souverbiana, Montrouzier, 1863
Neritopsis radula, Linne, 1758; *Nerita*
Acmaea costata, Sowerby, 1839; *Lottia*
saccharina, Linne, 1758; *Patella*
Phenacolepas cinnamomea, Gould, 1846; *Patella*
crenulata, Broderip, 1834; *Scutella*
senta, Hedley, 1899
Helcioniscus illibrata, Verco, 1906
Litorina coccinea, Martyn, 1784; *Limax*
mauritiana, Lamarck, 1822; *Phasianella*
melanacme, Smith, 1876
nebulosa, Lamarck, 1822; *Phasianella*
pallescens, Philippi, 1846
picta, Philippi, 1846
scabra, Linne, 1758; *Helix*
undulata, Gray, 1839
Tectarius malaccanus, Philippi, 1847; *Littorina*
nodulosus, Gmelin, 1791; *Trochus*
Risella melanostoma, Gmelin, 1791; *Trochus*
tantilla, Gould, 1849
Fossarus brumalis, Hedley, 1907
cereus, Watson, 1880
Adeorbis plana, Sowerby, 1864
Planaxis sulcatus, Born, 1778; *Buccinum*
brasilianus, Lamarck, 1822; *Buccinum*
zonatus, A. Adams, 1853
Quoyia decollata, Quoy and Gaimard, 1833; *Planaxis*
Rissoa atropurpurea, Frauenfeld, 1867; *Setia*
australiæ, Frauenfeld, 1867
cheilostoma, Tenison-Woods, 1879
devecta, Tate, 1899
flammea, Frauenfeld, 1867; *Sabanaea*
frauenfeldi, Schwartz, 1869
incidata, Frauenfeld, 1867; *Sabanaea*
liddelliana, Hedley, 1907
nitens, Frauenfeld, 1867; *Setia*
novarensis, Frauenfeld, 1867; *Alvania*
olivacea, Frauenfeld, 1867; *Alvania*
Onoba glomerosa, Hedley, 1907
mercurialis, Watson, 1886; *Rissoa*
Epigrus dissimilis, Watson, 1883; *Eulima*
verconis, Tate, 1899; *Rissoa*
xanthias, Watson, 1886; *Mucronalia*
Amphithalamus capricorneus, Hedley, 1907
jacksoni, Brazier, 1895; *Rissoa*
salebrosus, Frauenfeld, 1868; *Alvania*
scrobiculatus, Watson, 1886; *Rissoa*

Anabathron ascensum, Hedley, 1907
contortum, Hedley, 1907
contabulatum, Frauenfeld, 1868
Aclis minutissima, Watson, 1886
Scaliola arenosa, A. Adams, 1862
bella, A. Adams, 1860
caledonica, Crosse, 1870
elata, Issel, 1869
Rissoina cardinalis, Brazier, 1877
clathrata, A. Adams, 1853
crassa, Angas, 1871
curtisi, Smith, 1881
efficata, Brazier, 1877
elegantula, Angas, 1880
exasperata, Souverbie, 1866
fasciata, A. Adams, 1853
hanleyi, Schwartz, 1860
inconspicua, Brazier, 1877
inermis, Brazier, 1877
kesteveni, Hedley, 1907
miranda, A. Adams, 1861
montrouzieri, Souverbie, 1862
nodicincta, A. Adams, 1853
obeliscus, Schwartz, 1860
pulchella, Brazier, 1877
reticulata, Sowerby, 1834; *Rissoa*
scalarina, A. Adams, 1853
scolopax, Souverbie, 1877
spirata, Sowerby, 1834; *Rissoa*
teres, Brazier, 1877
thaumasia, Melvill and Standen, 1898
triangularis, Watson, 1886
Alaba flammea, Pease, 1867; *Rissoa*
phasianella, Angas, 1867
goniochila, A. Adams, 1860; *Styliferina*
semistriata, Philippi, 1849
Diala martensii, Issel, 1869
Litiopa melanostoma, Rang, 1829
Obtortio fulva, Watson, 1886; *Alaba*
striata, Watson, 1886; *Alaba*
Cithna marmorata, Hedley, 1907
Stenothyra australis, Hedley, 1901
Pyrgula clathrata, A. Adams, 1855
Truncatella ferruginea, Cox, 1868
teres, Pfeiffer, 1857
yorkensis, Cox, 1868
Hipponix conica, Schumacher, 1817; *Amalthea*
barbata, Sowerby, 1835; *Hipponyx*
Cheilea equestris, Linne, 1758; *Patella*
Calyptraea pellucida, Reeve, 1859; *Trochita*
Crepidula aculeata, Gmelin, 1791; *Patella*
Capulus tricarinatus, Linne, 1767; *Patella*
calyptra, Martyn, 1784; *Patella*
Cerithium album, Hombron and Jacquinot, 1853
articulatum, A. Adams and Reeve, 1850
balteatum, Philippi, 1848
bicanaliferum, Brazier, 1877
citrinum, Sowerby, 1855
coarctatum, Sowerby, 1866
columna, Sowerby, 1834
contractum, Sowerby, 1855
eximium, Sowerby, 1855
fasciatum, Bruguière, 1792
fusiforme, Sowerby, 1855
graciliforme, Sowerby, 1865

- Cerithium granosum, Kiener, 1842
  - kochi, Philippi, 1848
  - lemniscatum, Quoy and Gaimard, 1834
  - macrostoma, Hinds, 1844
  - mitraeforme, Sowerby, 1855
  - morus, Lamarck, 1822
  - nigrobalteatum, Smith, 1884
  - novaehiberniae, Sowerby, 1855
  - novaehollandiæ, Sowerby, 1855
  - petrosum, Wood, 1828
  - piperitum, Sowerby, 1855
  - rostratum, Sowerby, 1855
  - rubus, Martyn, 1784; *Clava*
  - salebrosum, Sowerby, 1855
  - taeniatum, Sowerby, 1865
  - tessellatum, Sowerby, 1855
  - torresi, Smith, 1884
  - turritum, Sowerby, 1855
  - variegatum, Quoy and Gaimard, 1834
- Bittium diplax, Watson, 1886
  - elegantissimum, Hedley, 1899; *Cerithium*
  - perparvulum, Watson, 1886
  - porcellanum, Watson, 1886
  - pupiforme, Watson, 1880
  - xanthum, Watson, 1886
  - zebrum, Kiener, 1842; *Cerithium*
- Ataxocerithium abbreviatum, Brazier, 1877; *Cerithium*
  - serotinum, A. Adams, 1855; *Cerithium*
- Plesiotrochus pagodiformis, Hedley, 1907
- Clava aluco, Linne, 1758; *Murex*
  - aspera, Linne, 1758; *Murex*
  - nodulosa, Bruguière, 1792
  - pulchra, Sowerby, 1855; *Vertagus*
  - recurva, Sowerby, 1855; *Cerithium*
  - sinensis, Gmelin, 1791; *Murex*
  - sowerbyi, Kiener, 1842; *Cerithium*
  - vertaga, Linne, 1767; *Murex*
- Cerithidea kieneri, Hombr. and Jacq., 1853; *Cerithium*
  - largillierti, Philippi, 1848; *Cerithium*
- Pyrazus australis, Quoy and Gaim., 1834; *Cerithium*
  - cingulatus, Gmelin, 1790; *Murex*
  - herculeus, Martyn, 1784; *Clava*
  - layardi, A. Adams, 1855; *Cerithium*
  - palustris, Linne, 1767; *Strombus*
  - sulcatus, Born, 1778; *Murex*
  - telescopium, Linne, 1758; *Trochus*
- Mathilda oppia, Hedley, 1907
  - elegantula, Angas, 1871
- Cerithiopsis angasi, Semper, 1874
  - ridicula, Watson 1886
- Triphora cornuta, Hervier, 1897
  - corrugata, Hinds, 1843
  - dolicha, Watson, 1886; *Triforis*
  - excelsior, Melvill and Standen, 1899; *Triforis*
  - funebris, Jousseaume, 1884
  - gigas, Hinds, 1843
  - kesteveni, Hedley, 1903
  - labiata, A. Adams, 1851
  - rubra, Hinds, 1843
  - rufula, Watson, 1886; *Triforis*
  - violacea, Quoy and Gaimard, 1834; *Cerithium*
- Turritella captiva, Hedley, 1907
  - cerea, Reeve, 1849
  - cingulifera, Sowerby, 1825
  - deliciosa, Watson, 1880

Turritella fascialis, Menke, 1830
  fastigiata, Adams and Reeve, 1850
  multilirata, Adams and Reeve, 1850
Eglisia tricarinata, Adams and Reeve, 1840
Modulus tectum, Gmelin, 1791; *Trochus*
Caecum amputatum, Hedley, 1894
  angustum, de Folin, 1886
  attenuatum, de Folin, 1879
  chinense, de Folin, 1867
  eburneum, de Folin, 1886
  lilianum, Hedley, 1903
  microcyclus, de Folin, 1879
  subflavum, de Folin, 1879
  succineum, de Folin, 1879
Strebloceras cygnicollis, Hedley, 1904
Parastrophia challengeri, de Folin, 1879
Watsonia elegans, de Folin, 1879
Ctiloceras clathratum, Hedley, 1902
  cyclicum, Watson, 1886; *Vermetus*
  striatum, Hedley, 1902
Crossea biconica, Hedley, 1902
  gatliffi, Hedley, 1902
  inverta, Hedley, 1907
  striata, Watson, 1883
Lippistes blainvilleanus, Petit, 1851; *Trichotropis*
  gracilentus, Brazier, 1877; *Trichotropis*
  zodiacus, Hedley, 1907
Couthouyia aculeata, Hedley, 1900
Vermicularia maxima, Sowerby, 1825; *Serpula*
  novaehollandiæ, Rousseau
  quoyi, H. and A. Adams, 1854; *Cladopoda*
Siliquaria cumingii, Morch, 1860
  ponderosa, Morch, 1860
  scalariformis, Morch, 1860
  trochlearis, Morch, 1860
Ianthina ianthina, Linne, 1758; *Helix*
Recluzia johnii, Chemnitz, 1795; *Helix*
Vanikoro cancellata, Hermann, 1781; *Nerita*
  clathrata, Recluz, 1845; *Narica*
  deshayesiana, Recluz, 1843; *Narica*
  gaimardi, A. Adams, 1854
Xenophora cerea, Reeve, 1845; *Phorus*
  exuta, Reeve, 1843; *Phorus*
  helvacea, Philippi, 1851
  pallidula, Reeve, 1843; *Phorus*
  solarioides, Reeve, 1845; *Phorus*
Strombus australis, Gray, 1827
  auris-dianæ, Linne, 1758
  elegans, Sowerby, 1842
  campbelli, Griffith and Pidgeon, 1834
  canarium, Linne, 1758
  dentatus, Linne, 1758
  gibberulus, Linne, 1758
  laciniatus, Dillwyn, 1817
  lentiginosus, Linne, 1858
  luhuanus, Linne, 1758
  melanostomus, Swainson, 1822
  papilio, Dillwyn, 1817
  plicatus, Bolten, 1798; *Lambis*
  sibbaldii, Sowerby, 1842
  urceus, Linne, 1758
  ustulatus, Schumacher, 1817; *Canarium*
  variabilis, Swainson, 1821
  vittatus, Linne, 1758

Pterocera bryonia, Gmelin, 1791; *Strombus*
lambis, Linne, 1758; *Strombus*
Terebellum terebellum, Linne, 1758; *Conus*
Epitonium aculeatum, Sowerby, 1844; *Scalaria*
auritum, Sowerby, 1844; *Scalaria*
bicarinatum, Sowerby, 1844; *Scalaria*
castum, Sowerby, 1873; *Scalaria*
denticulatum, Sowerby, 1844; *Scalaria*
dentiscalpium, Watson, 1883; *Scalaria*
hyalinum, Sowerby, 1844; *Scalaria*
irregulare, Sowerby, 1844; *Scalaria*
kieneri, Canefri, 1876; *Cirsotrema*
lyra, Sowerby, 1844; *Scalaria*
muricatum, Kiener, 1839; *Scalaria*
obliquum, Sowerby, 1844; *Scalaria*
philippinarum, Sowerby, 1844; *Scalaria*
replicatum Sowerby, 1844; *Scalaria*
revolutum, Hedley, 1899; *Scala.*
rubrolineatum, Sowerby, 1844; *Scalaria*
scalare, Linne, 1758; *Turbo*
subauriculatum, Souverbie, 1866; *Scalaria*
subnudatum, Sowerby, 1874; *Scalaria*
tenuicostatum, Sowerby, 1844; *Scalaria*
turriculum, Sowerby, 1844; *Scalaria*
varicosum, Lamarck, 1822; *Scalaria*
vestale, Hinds, 1843; *Scalaria*
Pyramidella auris-cati, Chemnitz, 1795; *Voluta*
concinna, A. Adams, 1860
gracilis, A. Adams, 1855
acus, Gmelin, 1791; *Voluta*
mitralis, A. Adams, 1855
pulchella, A. Adams, 1854; *Obeliscus*
terebelloides, A. Adams, 1854; *Obeliscus*
tessellata, A. Adams, 1854; *Obeliscus*
turrita, A. Adams, 1854; *Obeliscus*
Syrnola cinctella, A. Adams, 1860
pulchra, Brazier, 1877
tincta, Angas, 1871
Oscilla tasmanica, Ten.-Woods, 1877; *Parthenia*
Odostomia aciculina, Souverbie, 1865
bulbula, Hedley, 1907
canaria, Hedley, 1907
clara, Brazier, 1877
compta, Brazier, 1877
convoluta, Watson, 1886
corpulenta, Watson, 1886
kymatodes, Watson, 1886
metata, Hedley, 1907
oodes, Watson, 1886
opaca, Hedley, 1901
oxia, Watson, 1886
pupa, Watson, 1886
rubra, Pease, 1868
sigma, Hedley, 1907
Turbonilla amoebaea, Watson, 1886; *Odostomia*
aplini, Brazier, 1877
cheverti, Hedley, 1901
confusa, Brazier, 1877
darnleyensis, Brazier, 1877
homoeotata, Watson, 1886; *Odostomia*
spina, Crosse and Fischer, 1884; *Turritella*
varicifera, Tate, 1898
Pyrgulina gliriella, Melvill and Standen, 1896
henni, Brazier, 1894; *Odostomia*
senex, Hedley, 1902
umeralis, Hedley, 1902
zea, Hedley, 1902

Elusa subulata, A. Adams, 1855; *Pyramidella*
Eulima acerrima, Watson, 1886
    acicula, Gould, 1849; *Stylifer*
    acuta, Sowerby, 1834
    amabilis, Brazier, 1877
    bivittata, H. and A. Adams, 1853
    brevis, Sowerby, 1834
    campyla, Watson, 1883
    cuspidata, A. Adams, 1854
    eurychades, Watson, 1883
    lactea, A. Adams, 1854
    latipes, Watson, 1883
    modicella, A. Adams, 1854
    nitens, Brazier, 1877
Melanella grandis, A. Adams, 1854; *Eulima*
    martinii, A. Adams, 1854; *Eulima*
    petterdi, Beddome, 1883; *Eulima*
    tortuosa, Adams and Reeve, 1850; *Eulima*
Stilifer astericola, Broderip, 1832
    auricula, Hedley, 1907
    orbiculata, Hedley, 1907
Mucronalia bizonula, Melvill, 1906
Scalenostoma striatum, Hedley, 1900
Eulimella acerrima, Watson, 1886
    angusta, Watson, 1886
    coacta, Watson, 1886
    columna, Hedley, 1907
    laxa, Watson, 1886
    subtilis, Watson, 1886
Architectonica hybrida, Linne, 1758; *Trochus*
    perdix, Hinds, 1844; *Solarium*
    perspectiva, Linne, 1758; *Trochus*
    straminea, Gmelin, 1791; *Trochus*
Torinia cælata, Hinds, 1844; *Solarium*
    dorsuosa, Hinds, 1844; *Solarium*
    variegata, Gmelin, 1791; *Trochus*
Omalaxis radiata, Hedley, 1907
Cymatium elongatum, Reeve, 1844; *Triton*
    encausticum, Reeve, 1844; *Triton*
    exaratum, Reeve, 1844; *Triton*
    gemmatum, Reeve, 1844; *Triton*
    chlorostoma, Lamarck, 1822; *Triton*
    moritinctum, Reeve, 1844; *Triton*
    pfeifferianum, Reeve, 1844; *Triton*
    pyrum, Linne, 1758; *Murex*
    rubicundum, Perry, 1811; *Septa*
    spengleri, Chemnitz, 1795; *Murex*
    tuberosum, Lamarck, 1822; *Triton*
    vespaceum, Lamarck, 1822; *Triton*
    gracile, Reeve, 1844; *Triton*
    labiosum, Wood, 1828; *Murex*
    lotorium, Linne, 1758; *Murex*
    sacrostoma, Reeve, 1844; *Triton*
    strangei, A. Adams and Angas, 1864; *Triton*
Septa tritonis, Linne, 1758; *Murex*
    aquatile, Reeve, 1844; *Triton*
Distortrix decipiens, Reeve, 1844; *Triton*
Bursa bitubercularis, Lamarck, 1822; *Ranella*
    gyrina, Linne, 1758; *Murex*
    lampas, Linne, 1758; *Murex*
    pusilla, Broderip, 1833; *Ranella*
    rana, Linne, 1758; *Murex*
    venustula, Reeve, 1844; *Ranella*
Argobuccinum succinctum, Linne, 1771; *Murex*

Gyrineum affine, Broderip, 1833; *Ranella*
pulchellum, Forbes, 1852; *Ranella*
pusillum, Broderip, 1833; *Ranella*
ranelloides, Reeve, 1844; *Triton*
rubicola, Perry, 1811; *Biplex*
Cassidea areola, Linne, 1758; *Buccinum*
coronulata, Sowerby, 1825; *Cassis*
glauca, Linne, 1758; *Buccinum*
nodulosa, Gmel., var. torquata, Rv.
pila, Reeve, 1848; *Cassis*
vibex, Linne, 1758; *Buccinum*
Cassis cornuta, Linne, 1758; *Buccinum*
nana, Ten.-Woods, 1879
Tonna chinensis, Dillwyn, 1817; *Buccinum*
cumingii, Reeve, 1849; *Dolium*
perdix, Linne, 1758; *Buccinum*
pomum, Linne, 1758; *Buccinum*
variegata, Lamarck, 1822; *Dolium*
Ficus communis, Bolten, 1798
Natica areolata, Recluz, 1844
alapapilionis, Bolten, 1798; *Cochlis*
buriasensis, Recluz, 1844
chinensis, Lamarck, 1822
colliei, Recluz, 1844
deidosa, Reeve, 1855
gualteriana, Recluz, 1844
helvacea, Lamarck, 1822
limpida, Smith, 1884
lineata, Bolten, 1798; *Cochlis*
raynoldiana, Recluz, 1844
seychellium, Watson, 1886
stellata, Martyn, 1786; *Nerita*
subcostata, Ten.-Woods, 1878
variabilis, Reeve, 1855
Polinices alba, Gray, 1827; *Natica*
albumen, Linne, 1758; *Nerita*
aurantium, Bolten, 1798; *Albula*
columnaris, Recluz, 1850; *Natica*
conicus, Lamarck, 1822; *Natica*
didyma, Bolten, 1798; *Albula*
filosa, Reeve, 1855; *Natica*
flemingiana, Recluz, 1843; *Natica*
incei, Philippi, 1853; *Natica*
mamilla, Linne, 1758; *Nerita*
melanostoma, Lamarck, 1822; *Natica*
melanostomoides, Quoy and Gaim., 1832; *Natica*
nux-castanea, Martyn, 1786; *Nerita*
plumbeus, Lamarck, 1822; *Natica*
vitellus, Linne, 1758; *Nerita*
Sigaretus australis, Dunker, 1871
eximius, Reeve, 1864
planulatus, Recluz
Lamellaria ophione, Gray, 1847
Cypraea angustata, Gmelin, 1791
annulus, Linne, 1758
arabica, Linne, 1758
argus, Linne, 1758
asellus, Linne, 1758
caput-serpentis, Linne, 1758
carneola, Linne, 1758
caurica, Linne, 1758
clandestina, Linne, 1767
cylindrica, Born, 1778
eburna, Barnes, 1824
erosa, Linne, 1758

- Cypraea errones, Linne, 1758
  - felina, Gmelin, 1791
  - fimbriata, Gmelin, 1791
  - flaveola, Linne, 1758
  - helvola, Linne, 1758
  - hirundo, Linne, 1758
  - isabella, Linne, 1758
  - limacina, Lamarck, 1810
  - lutea, Gronovius, 1781
  - lynx, Linne, 1758
  - mauritiana, Linne, 1758
  - miliaris, Gmelin, 1791
  - moneta, Linne, 1758
  - notata, Gill, 1858
  - punctata, Linne, 1771
  - quadrimaculata, Gray, 1824
  - saulæ, Gaskoin, 1843
  - sophiæ, Brazier, 1875
  - subviridis, Reeve, 1835
  - tigris, Linne, 1758
  - valentia, Perry, 1811
  - vitellus, Linne, 1758
  - walkeri, Gray, 1832
  - xanthodon, Gray, 1832
  - ziczac, Linne, 1758
- Trivia globosa, Gray, 1832; *Cypraea*
  - grando, Gaskoin, 1848
  - pellucida, Gaskoin, 1846
  - producta, Gaskoin, 1835; *Cypraea*
  - scabriuscula, Gray, 1828; *Cypraea*
  - staphylaea, Linne, 1758; *Cypraea*
  - sulcata, Gaskoin, 1848; *Cypraea*
  - vitrea, Gaskoin, 1848; *Cypraea*
- Erato angiostoma, Sowerby, 1841
  - gallinacea, Hinds, 1844; *Ovulum*
  - lachryma, Gray, 1832
  - nana, Reeve, 1865
- Ovula brevis, Sowerby, 1830
  - margarita, Sowerby, 1849
  - ovum, Linne, 1758; *Bulla*
  - punctata, Duclos, 1830
  - tortilis, Martyn, 1784, *Cypraea*
  - volva, Linne, 1758; *Bulla*
- Radius angasi, Reeve, 1865; *Ovulum*
- Scaphella canaliculata, McCoy, 1869; *Voluta*
  - flavicans, Gmelin, 1791; *Voluta*
  - maculata, Swainson, 1822
  - magnifica, Chemnitz, 1795; *Voluta*
  - marmorata, Swainson, 1822; *Voluta*
  - nivosa, Lamarck, 1804; *Voluta*
  - perplicata, Hedley, 1902; *Voluta*
  - pulchra, Sowerby, 1825; *Voluta*
  - punctata, Swainson, 1823; *Voluta*
  - ruckeri, Crosse, 1867; *Voluta*
  - rutila, Broderip, 1825; *Voluta*
  - spenceriana, Gatliff, 1908; *Voluta*
  - studeri, Martens, 1897; *Voluta*
  - volva, Gmelin, 1791; *Voluta*
  - zebra, Leach, 1814; *Voluta*
- Cymbium flammeum, Bolten, 1798
- Lyria deliciosa, Montrouzier, 1859; *Voluta*
  - nucleus, Lamarck, 1811; *Voluta*
- Oliva annulata, Gmelin, 1791; *Voluta*
  - australis, Duclos
  - caerulea, Bolten, 1798; *Porphyria*
  - gibbosa, Born, 1778; *Voluta*

Oliva guttata, Lamarck, 1810
ispidula, Linne, 1758; *Voluta*
miniacea, Bolten, 1798; *Porphyria*
multiplicata, Reeve, 1852
oliva, Linne, 1758; *Voluta*
ornata, Marrat, 1867
tigrina, Meuschen, 1787; *Cylindrus*
Olivella nympha, Adams and Angas, 1863
Ancilla cingulata, Sowerby, 1830; *Ancillaria*
elongata, Gray, 1847; *Ancillaria*
oblonga, Sowerby, 1830; *Ancillaria*
similis, Sowerby, 1859; *Ancillaria*
tricolor, Gray, 1847; *Ancillaria*
Marginella alta, Watson, 1886
brachia, Watson, 1886
fusiformis, Hinds, 1844
guttula, Reeve, 1865
laevigata, Brazier, 1877
mustelina, Angas, 1871; *Hyalina*
ochracea, Angas, 1871
ovulum, Sowerby, 1846
pachia, Watson, 1886
Cancellaria antiquata, Hinds, 1844
australis, Sowerby, 1841
bicolor, Hinds, 1843
costifera, Sowerby, 1849
lamellosa, Hinds, 1843
macrospira, Adams and Reeve, 1850
obliquata, Lamarck, 1822
Terebra affinis, Gray, 1834
australis, Smith, 1873
bernardi, Deshayes, 1857
caelata, Adams and Reeve, 1850
cancellata, Quoy and Gaimard, 1833
chlorata, Lamarck, 1822
circumcincta, Deshayes, 1857
columellaris, Hinds, 1844
crenulata, Linne, 1758; *Buccinum*
dimidiata, Linne, 1758; *Buccinum*
exigua, Deshayes, 1859
feldmanni, Bolten, 1798; *Epitonium*
jukesi, Deshayes, 1857
maculata, Linne, 1758; *Buccinum*
marmorata, Deshayes, 1859
muscaria, Lamarck, 1822
ornatum, Martyn, 1786; *Buccinum*
pertusa, Born, 1778; *Buccinum*
polygyrata, Deshayes, 1859
triseriata, Gray, 1834
spectabilis, Hinds, 1844
straminea, Gray, 1834
subulata, Linne, 1767; *Buccinum*
taylori, Reeve, 1860
tenera, Hinds, 1844
turrita, Smith, 1873
undulata, Gray, 1834
Conus aculeiformis, Reeve, 1844
arenatus, Hwass, 1792
atramentosus, Reeve, 1849
lizardensis, Crosse, 1865
capitaneus, Linne, 1758
ceylanensis, Hwass, 1792
deshayesi, Reeve, 1844
cinctus, Swainson, 1833
coccineus, Gmelin, 1791

Conus coxeni, Brazier, 1875
emaciatus, Reeve, 1849
eximius, Reeve, 1849
figulinus, Linne, 1758
flavidus, Lamarck, 1810
geographus, Linne, 1758
glans, Hwass, 1792
ebraeus, Linne, 1758
lineatus, Bruguière, 1792
litteratus, L. v. millepunctatus, Lamk.
lividus, Bruguière, 1792
magus, Linne, 1758
marmoreus, Linne, 1758
musicus, Hwass, 1792
mustelinus, Hwass, 1792
nanus, Broderip, 1833
nussatella, Linne, 1758
peasei, Brazier, 1877; *Lithoconus*
praecellens, A. Adams, 1854
radiatus, Gmelin, 1791
spectrum, Linne, 1758
stercus-muscarum, Linne, 1758
striatus, Linne, 1758
sugillatus, Reeve, 1844
suturatus, Reeve, 1844
tenellus, Chemnitz
tenuistriatus, Sowerby, 1858
terebra, Born, 1778
tessellatus, Born, 1778
textile, Linne, 1758
tiaratus, Broderip, 1833
trigonus, Reeve, 1848
varius, Linne, 1758
vitulinus, Hwass, 1792
Glyphostoma polynesiense, Reeve, 1846
aliceæ, Melvill and Standen, 1893
spurca, Hinds, 1844; *Clavatula*
strombillum, Hervier, 1895
tricolor, Brazier, 1876; *Clathurella*
vultuosum, Reeve, 1846
huberti, Sowerby, 1893
Pleurotoma gemmata, Hinds, 1843
jubata, Hinds, 1843
Columbarium distephanotis, Melvill, 1891
spinicinctum, Martens, 1881; *Pleurotoma*
Clathurella amabilis, Hinds, 1843; *Clavatula*
arctata, Reeve, 1846; *Pleurotoma*
daedala, Reeve, 1846; *Pleurotoma*
darnleyi, Brazier, 1876; *Mangilia*
debilis, Hinds, 1843; *Clavatula*
macleayi, Brazier, 1876
moretonica, Smith, 1882; *Pleurotoma*
quisqualis, Hinds, 1843; *Clavatula*
tessellata, Hinds, 1843; *Clavatula*
thespesia, Melvill and Standen, 1896; *Daphnella*
tincta, Reeve, 1846; *Pleurotoma*
Daphnella aulacoessa, Watson, 1881; *Clathurella*
axis, Reeve, 1846; *Pleurotoma*
cassandra, Hedley, 1904
excavata, Gatliff, 1906
marmorata, Hinds, 1844
ornata, Hinds, 1844
pluricarinata, Reeve, 1845; *Pleurotoma*
souverbiei, Smith, 1882
subula, Reeve, 1845; *Pleurotoma*

Mangilia abyssicola, Reeve, 1846
angulata, Reeve, 1846
argillacea, Hinds, 1843; *Clavatula*
balteata, Reeve, 1846
bicolor, Reeve, 1846
capillacea, Reeve, 1846
chionea, Melvill and Standen, 1899
crassilabrum, Reeve, 1843; *Pleurotoma*
cylindrica, Reeve, 1846
exquisita, Smith, 1882
goodalli, Reeve, 1846
gracilenta, Reeve, 1843; *Pleurotoma*
gracilis, Reeve, 1846
hexagonalis, Reeve, 1845; *Pleurotoma*
languida, Reeve, 1845; *Pleurotoma*
maculata, Reeve, 1846
pellucida, Reeve, 1846
pessulata, Reeve, 1846
ponderosa, Reeve, 1846
pulchella, Reeve, 1846
undaticosta, Reeve, 1845; *Pleurotoma*
Drillia alabaster, Reeve, 1843; *Pleurotoma*
essingtonensis, Smith, 1888; *Pleurotoma*
exigua, Hombron and Jacq., 1853; *Pleurotoma*
laterculata, Sowerby, 1870; *Pleurotoma*
nitens, Hinds, 1843; *Clavatula*
putilla, Reeve, 1845; *Pleurotoma*
radula, Hinds, 1843; *Pleurotoma*
sinensis, Hinds, 1843; *Clavatula*
spaldingi, Brazier, 1876
sterrha, Watson, 1881; *Pleurotoma*
tayloriana, Reeve, 1846; *Pleurotoma*
varicosa, Reeve, 1843; *Pleurotoma*
ventricosa, Smith, 1888; *Pleurotoma*
violacea, Hinds, 1843; *Pleurotoma*
bijubata, Reeve, 1843; *Pleurotoma*
brevicaudata, Reeve, 1843; *Pleurotoma*
fusca, Hombron and Jacq., 1853; *Pleurotoma*
punctata, Reeve, 1845; *Pleurotoma*
Pleurotomella vepratica, Hedley, 1903; *Pleurotoma*
Turris acuta, Perry, 1811; *Pleurotoma*
armillata, Reeve, 1845; *Pleurotoma*
crispa, Lamarck, 1822; *Pleurotoma*
granosa, Helbling, 1779; *Murex*
indica, Bolten, 1798
spectabilis, Reeve, 1843; *Pleurotoma*
undosa, Lamarck, 1822; *Pleurotoma*
Vasum turbinellum, Linne, 1767; *Voluta*
ceramicum, Linne, 1758; *Murex*
Turbinella iricolor, Hombr. and Jacquinot, 1853
subnassatula, Souverbie, 1872
Tudicla armigera, A. Adams, 1856
spinosa, H. and A. Adams, 1863
Galeodes cochlidium, Linne, 1758; *Murex*
pricei, Smith, 1887; *Fusus*
Megalatractus aruanus, Linne, 1758; *Murex*
Siphonalia gracillima, Adams and Reeve, 1850; *Fusus*
Fasciolaria filamentosa, Bolten, 1798; *Fusus*
Latirus angustus, Smith, 1884
australiensis, Reeve, 1847; *Turbinella*
craticulatus, Linne, 1758; *Murex*
recurvirostris, Schub. Wagn., 1829; *Turbinella*
gibbulus, Gmelin, 1791; *Murex*
polygonus, Gmelin, 1791; *Murex*

Peristernia incarnata, Deshayes, 1830; *Turbinella*
lyrata, Reeve, 1847; *Turbinella*
wagneri, Anton, 1839; *Turbinella*
Leucozonia smaragdula, Linne, 1758; *Buccinum*
Imbricaria conica, Schumacher, 1817
Cylindra crenulata, Gmelin, 1791; *Voluta*
Mitra amanda, Reeve, 1845
amabilis, Reeve, 1845
antonelli, Dohrn, 1860
arenosa, Lamarck, 1811
armillata, Reeve, 1845
aurantia, Gmelin, 1791; *Voluta*
avenacea, Reeve, 1845
bernhardina, Bolten, 1798
caffra, Linne, 1758; *Voluta*
capricornea, Hedley, 1907
circula, Kiener, 1839
crassa, Swainson, 1822
crenifera, Lamarck, 1811
cruentata, Gmelin, 1791; *Voluta*
cucumerina, Lamarck, 1811
curvilirata, Sowerby, 1874
deshayesii, Reeve, 1844
delicata, A. Adams, 1853
dichroa, A. Adams, 1853
duplilirata, Reeve, 1845
filaris, Linne, 1771; *Voluta*
formosa, A. Adams, 1853
fragra, Quoy and Gaimard, 1833
granatina, Lamarck, 1811
hastata, Sowerby, 1874
hebes, Reeve, 1845
interlirata, Reeve, 1844
jukesii, A. Adams, 1853
leucodesma, Reeve, 1844
limosa, Martyn, 1786
longispira, Sowerby, 1874
lubens, Reeve, 1845
lucida, Reeve, 1845
lugubris, Swainson, 1821
michaui, Crosse and Fischer, 1864
mitra, Linne, 1758; *Voluta*
modesta, Reeve, 1845
obeliscus, Reeve, 1844
patriarchalis, Gmelin, 1791; *Voluta*
peasei, Dohrn, 1860
plicaria, Linne, 1758; *Voluta*
porphyritica, Reeve, 1844
procissa, Reeve, 1844
pura, A. Adams, 1853
reticulata, A. Adams, 1853
retusa, Lamarck, 1811
rotundilirata, Reeve, 1844
rubritincta, Reeve, 1844
rufescens, A. Adams, 1853
rugosa, Gmelin, 1791; *Voluta*
suturata, Reeve, 1845
sanguisuga, Linne, 1758; *Voluta*
scabricula, Linne, 1767; *Voluta*
sculptilis, Reeve, 1845
scutulata, Gmelin, 1791, *Voluta*
subdivisa, Bolten, 1798; *Vexillum*
solida, Reeve, 1844
tabanula, Lamarck, 1811
taeniata, Lamarck, 1811

Mitra variabilis, Reeve, 1844
variegata, Gmelin, 1791; *Voluta*
vermiculata, Martyn, 1786
vulpecula, Linne, 1758; *Voluta*
zephyrina, Sowerby, 1874
Cantharus balteatus, Reeve, 1846; *Buccinum*
curtisianus, Smith, 1884; *Tritonidea*
mollis, Gould, 1860; *Pisania*
semitextus, Hedley, 1899; *Nassa*
undosus, Linne, 1758; *Buccinum*
Pisania crenilarum, A. Adams, 1855
Cyllene lactea, Adams and Angas, 1863
pulchella, Adams and Reeve, 1850
Phos roseatus, Hinds, 1844
rufocinctus, A. Adams, 1850
scalaroides, A. Adams, 1851
sculptilis, Watson, 1886
senticosus, Linne, 1758; *Murex*
spinicostatus, A. Adams, 1851
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Engina anaxeres, Kiener, 1836; *Purpura*
concinna, Reeve, 1846; *Ricinula*
lauta, Reeve, 1846; *Ricinula*
lineata, Reeve, 1846; *Ricinula*
mendicaria, Linne, 1758; *Voluta*
reevei, Tryon, 1883
siderea, Reeve, 1846; *Ricinula*
trifasciata, Reeve, 1846; *Ricinula*
Nassaria bitubercularis. A. Adams, 1855; *Hindsia*
Colubraria antiquata, Hinds, 1844; *Triton*
tessellata, Reeve, 1844; *Triton*
Maculotriton bracteatus, Hinds, 1844; *Triton*
Arcularia albescens, Dunker, 1849; *Buccinum*
algida, Reeve, 1853; *Nassa*
arcularia, Linne, 1758; *Buccinum*
callosa, A. Adams, 1852; *Nassa*
coronata, Bruguière, 1789; *Buccinum*
crebrelineata, Hombr. Jacq., 1853
cremata, Hinds, 1844
crenulata, Bruguière, 1789; *Buccinum*
delicata, A. Adams, 1852; *Nassa*
densigranata, Reeve, 1854; *Nassa*
dorsata, Bolten, 1798; *Buccinum*
fretorum, Melv. Stand., 1899; *Nassa*
gemmulata, Lamarck, 1822; *Buccinum*
glans, Linne, 1758; *Buccinum*
lachrymosa, Reeve, 1853; *Nassa*
lurida, Gould, 1850; *Nassa*
marginulata, Lamarck, 1822; *Buccinum*
melanioides, Reeve, 1853; *Nassa*
mirostoma, Pease, 1867; *Nassa*
mucronata, A. Adams, 1852; *Nassa*
nana, A. Adams, 1852; *Nassa*
paupera, Gould, 1850; *Nassa*
picta, Dunker, 1846; *Buccinum*
plebicula, Gould, 1860; *Nassa*
psila, Watson, 1882; *Nassa*
pullus, Linne, 1758; *Buccinum*
ravida, A. Adams, 1852; *Nassa*
rotunda, Melv. Stand., 1896; *Nassa*
semiplicata, A. Adams, 1852; *Nassa*
suturalis, Lamarck, 1822; *Buccinum*
Pyrene abyssicola, Brazier, 1877; *Columbella*
atkinsoni, Ten.-Woods, 1876; *Mangelia*
contaminata, Gaskoin, 1852; *Columbella*

Pyrene darwini, Angas, 1877; *Columbella*
digglesi, Brazier, 1875; *Columbella*
essingtonensis, Reeve, 1859; *Columbella*
flava, Bruguière, 1789; *Buccinum*
fulgurans, Lamarck, 1822; *Columbella*
galaxias, Reeve, 1859; *Columbella*
gemmulifera, Hedley, 1907
gowllandi, Brazier, 1875; *Columbella*
intexta, Gaskoin, 1852; *Columbella*
clathrata, Brazier, 1877; *Columbella*
conspersa, Gaskoin, 1852; *Columbella*
cumingii, Reeve, 1859; *Columbella*
duclosiana, Sowerby, 1844; *Columbella*
peasei, v. Mart. and Langk., 1871; *Columbella*
læta, Brazier, 1877; *Columbella*
lurida, Hedley, 1907
melvilli, Hedley, 1899; *Columbella*
merita, Brazier, 1877; *Columbella*
moleculina, Duclos, 1840; *Columbella*
nivosa, Reeve, 1859; *Columbella*
pardalina, Lamarck, 1822; *Buccinum*
plicaria, Montrouzier, 1862; *Columbella*
pudica, Brazier, 1877; *Columbella*
roseotincta, Hervier, 1899; *Columbella*
russelli, Brazier, 1875; *Columbella*
semiconvexa, Lamarck, 1822; *Buccinum*
troglodytes, Souverbie, 1866; *Columbella*
varians, Sowerby, 1832; *Columbella*
versicolor, Sowerby, 1832; *Columbella*

Murex acanthodes, Watson, 1883
acanthopterus, Schroeter, 1783
aduncospinosus, Reeve, 1845
denudatus, Perry, 1811; *Triplex*
axicornis, Lamarck, 1822
brevispina, Lamarck, 1822
capucinus, Lamarck, 1822
cervicornis, Lamarck, 1822
confusa, Brazier, 1877
coppingeri, Smith, 1884
cornucervi, Bolten, 1798; *Purpura*
corrugatus, Sowerby, 1840
macgillivrayi, Dohrn, 1862
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miliaris, Gmelin, 1791
multiplicatus, Sowerby, 1895
mundus, Reeve, 1846
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salmoneus, Melvill and Standen, 1899
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ternispina, Lamarck, 1822
territus, Reeve, 1845
tetragonus, Broderip, 1833
trapa, Bolten, 1798
triremis, Perry, 1811; *Aranea*

Aspella anceps, Lamarck, 1822; *Ranella*

Trophon contractus, Reeve, 1846; *Buccinum*
paivae, Crosse, 1864

Thais alveolata, Reeve, 1846; *Purpura*
bitubercularis, Lamarck, 1822; *Purpura*
echinata, Blainville, 1832; *Purpura*

Thais gemmulata, Lamarck, 1822; *Purpura*
hippocastanea, Linne, 1758; *Murex*
succinctus, Martyn, 1784; *Buccinum*
persica, Linne, 1758; *Buccinum*
pseudamygdala, Hedley, 1903; *Purpura*
rustica, Lamarck, 1822; *Purpura*
Vexilla vexillum, Gmelin, 1791; *Strombus*
Nassa sertum, Bruguiere, 1789; *Buccinum*
Galeropsis monodonta, Quoy and Gaim, 1833; *Purpura*
Rapa rapiformis, Born, 1778; *Murex*
rapa, Linne, 1767; *Bulla*
Drupa cavernosa, Reeve, 1846; *Ricinula*
chaidea, Duclos, 1832; *Purpura*
concatenata, Blainville, 1832; *Purpura*
heptagonalis, Reeve, 1846; *Ricinula*
mancinella, Linne, 1758; *Murex*
margariticola, Broderip, 1832; *Murex*
marginalba, Blainville, 1832; *Purpura*
muricata, Reeve; 1846; *Ricinula*
ochrostoma, Blainville, 1832; *Purpura*
ozenneana, Crosse, 1861; *Ricinula*
porphyrostoma, Reeve, 1846; *Ricinula*
ricinus, Linne, 1758; *Murex*
rubusidæa, Bolten, 1798
spinosa, H. and A. Adams, 1853; *Pentadactylus*
Coralliophila squamulosa, Reeve, 1846; *Purpura*
imbricata, Smith, 1876; *Fusus*
Ellobium auris-judæ, Linne, 1758; *Bulla*
helvaceum, Pfeiffer, 1876; *Auriculus*
semisculptum, H. and A. Adams, 1854
Pythia argenvillei, Pfeiffer, 1853
nux, Reeve, 1860; *Scarabus*
Cassidula angulifera, Petit, 1841; *Auricula*
auris-felis, Bruguière, 1789; *Bulimus*
rugata, Menke, 1843; *Auricula*
sowerbyana, Pfeiffer, 1853; *Auricula*
zonata, H. and A. Adams, 1855
Marinula patula, Lowe, 1835; *Melampus*
Laimodonta conica, Pease, 1862
Ophicardelus quoyi, H. and A. Adams, 1855
sulcatus, H. and A. Adams, 1855; *Laimodonta*
Plecotrema moniliferum, H. and A. Adams, 1854
typicum, H. and A. Adams, 1854
Melampus adamsianus, Pfeiffer, 1855
cristatus, Pfeiffer, 1855
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pulchellus, Petit, 1843; *Auricula*
granosa, Hombr. and Jacq., 1853; *Auricula*
trifasciatus, Kuster, 1844
variabilis, Gassies, 1863
Blauneria leonardi, Crosse, 1872
Onchidium punctatum, Quoy and Gaimard, 1832
tumidum, Semper, 1880
verruculatum, Cuvier, 1804
meriakrii, Stantschinsky, 1907
fungiforme, Stantschinsky, 1907
buetschlii, Stantschinsky, 1907
coriaceum, Semper, 1882
Onchidina australis, Semper, 1882
Siphonaria atra, Quoy and Gaimard, 1833
denticulata, Quoy and Gaimard, 1833
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siquijorensis, Reeve, 1856
Actaeon flammeus, Gmelin, 1791; *Voluta*
insculptus, Reeve, 1842; *Tornatella*

- Pupa affinis, A. Adams, 1855; *Solidula*
  - coccinata, Reeve, 1842; *Tornatella*
  - nitidula, Lamarck, 1822; *Tornatella*
  - solidula, Linne, 1758; *Bulla*
  - sulcata, Gmelin, 1791; *Voluta*
  - suturalis, A. Adams, 1855; *Solidula*
- Leucotina casta, A. Adams, 1853; *Monoptgyma*
  - helva, Hedley, 1900
- Tornatina acrobeles, Watson, 1883; *Utriculus*
  - biplex, A. Adams, 1850; *Bulla*
  - gracilis, A. Adams, 1850
  - leptekes, Watson, 1883; *Utriculus*
  - planospira, A. Adams, 1850; *Bulla*
  - voluta, Quoy and Gaimard, 1833; *Bulla*
- Volvula sulcata, Watson, 1883; *Cylichna*
- Ringicula abyssicola, Brazier, 1877
  - arctata, Gould, 1860
  - assularum, Watson, 1883
  - caron, Hinds, 1844
  - pusilla, Watson, 1883
- Retusa amphizosta, Watson, 1883; *Utriculus*
  - complanata, Watson, 1883; *Utriculus*
  - nitida, A. Adams, 1850; *Bulla*
  - simillima, Watson, 1883; *Utriculus*
- Cylichna arachis, Quoy and Gaimard, 1835; *Bulla*
  - bizona, A. Adams, 1850; *Bulla*
  - concentrica, A. Adams, 1850; *Bulla*
  - crispula, Watson, 1883
  - decussata, A. Adams, 1850; *Bulla*
  - doliaria, Hedley, 1907
  - dubiosa, Brazier, 1877; *Atys*
  - granosa, Brazier, 1877; *Mnestia*
  - pulchra, Brazier, 1877; *Atys*
  - strigella, A. Adams, 1850; *Bulla*
- Atys cheverti, Brazier, 1877
  - cylindrica, Helbling, 1779; *Bulla*
  - darnleyensis, Brazier, 1877
  - debilis, Pease, 1860
  - decora, Brazier, 1877; *Haminea*
  - densa, Brazier, 1877
  - dentifera, A. Adams, 1850; *Bulla*
  - elongata, A. Adams, 1850; *Bulla*
  - monodonta, A. Adams, 1850; *Bulla*
  - naucum, Linne, 1758; *Bulla*
  - solida, Bruguière, 1792; *Bulla*
  - tortuosa, A. Adams, 1850; *Bulla*
- Scaphander multistriatus, Brazier, 1877
- Bullaria adamsi, Menke, 1850; *Bulla*
  - punctulata, A. Adams, 1850; *Bulla*
- Cylindrobulla fischeri, A. Adams and Angas, 1864
  - pusilla, Nevill, 1869
- Volvatella pyriformis, Pease, 1860
- Haminea brevis, Quoy and Gaimard, 1883; *Bulla*
  - crocata, Pease, 1860
  - papyrus, A. Adams, 1850; *Bulla*
  - vitrea, A. Adams, 1850; *Bulla*
- Aplustrum aplustre, Linne, 1758; *Bulla*
- Hydatina physis, Linne, 1758; *Bulla*
- Philine angasi, Crosse and Fischer, 1845; *Bullæa*
  - schroeteri, Philippi, 1844; *Bullæa*
- Aglaja marmorata, Smith, 1884; *Doridium*
- Tethys denisoni, Smith, 1884; *Aplysia*
  - sparsinotata, Smith, 1884; *Aplysia*
  - tigrina, Rang., 1828; *Aplysia*
- Paraplysia piperata, Smith, 1884; *Aplysia*

Dolabella ecaudata, Rang., 1828; *Aplysia*
scapula, Martyn, 1786; *Patella*
Salinator fragilis, Lamarck, 1822; *Ampullaria*
Cavolina gibbosa, D'Orbigny, 1836; *Hyalœa*
inflexa, Lesueur, 1813; *Hyalœa*
longirostris, Lesueur, 1821; *Hyalœa*
quadridentata, Lesueur, 1821; *Hyalœa*
trispinosa, Lesueur, 1821; *Hyalœa*
uncinata, D'Orbigny, 1836; *Hyalœa*
Limacina bulimoides, D'Orbigny, 1836; *Atlanta*
inflata, D'Orbigny, 1836; *Atlanta*
leseuri, D'Orbigny, 1836; *Atlanta*
Clio acicula, Rang., 1828; *Creseis*
pyramidata, Linne, 1767
striata, Rang., 1828; *Creseis*
subula, Quoy and Gaimard, 1827; *Cleodora*
virgula, Rang., 1828; *Creseis*
Cuvierina columnella, Rang., 1827; *Cuvieria*
Euselenops luniceps, Cuvier, 1830; *Pleurobranchus*
Umbraculum umbrella, Martyn, 1786; *Patella*
Glaucus atlanticus, Forster, 1777
Bornella digitata, Adams and Reeve, 1850
Hexabranchus flammulatus, Q. and Gaim., 1833; *Doris*
Thordisa clandestina, Bergh., 1884
Platydoris coriacea, Abraham, 1777; *Doris*
cruenta, Gray, 1850; *Asteronotus*
infrapicta, Smith, 1884; *Doris*
Hypselodoris lineolata, van Hasselt, 1824; *Doris*
Ceratosoma gibbosum, Rochebrune, 1894
lixi, Rochebrune, 1894
tenue, Abraham, 1876
Miamira sinuata, van Hasselt, 1824; *Doris*
Sphaerodoris incii, Gray, 1850; *Doris*
Placomopherus insignis, Smith, 1884

SCAPHOPODA.

Dentalium annulosum, Brazier, 1877
bisexangulatum, Sowerby, 1860
cheverti, Sharp and Pilsbry, 1897
clathratum, Martens, 1881
dispar, Sowerby, 1860
duodecimcostatum, Brazier, 1877
hexagonum, Gould, 1859
javanum, Sowerby, 1860
longitrorsum, Reeve, 1842
octangulatum, Donovan, 1803
pseudosexagonum, Deshayes, 1825
quadricostatum, Brazier, 1877
Siphonodentalium eboracense, Watson, 1879
Cadulus laevis, Brazier, 1877; *Dentalium*
prionotus, Watson, 1879; *Siphonodentalium*
simillimus, Watson, 1879

BRACHIOPODA.

Lingula anatina, Lamarck, 1801
Crania suessi, Reeve, 1862
Cryptopora brazieri, Crane, 1886; *Atretia*
Megerlia sanguinolenta, Gmelin, 1791; *Anomia*

TORRES STRAIT.

[*Abstract of Lecture by C. HEDLEY, F.L.S., Assistant Curator, Australian Museum, Sydney.*]

The subject of Torres Straits is equally fascinating whether considered from the standpoint of geologist, biologist, or anthropologist. From the latter aspect it forms the boundary between the Australian and the Papuan races. Though much farther advanced in civilisation, the Papuan was unable to gain a footing in Australia. As an agriculturist, a trader, a navigator, or a mechanic, the Papuan gained, held, and improved the islands of the Strait. But as a fighter he was the inferior of the fierce tribe which held the strong strategic point of Cape York. This inferiority was partly the inferiority of the agriculturist to the hunter, and partly the inferiority of the bow and arrow to the womerah and javelin. The Australian propelled a heavier missile farther. The prompt way in which the Cape York men turned out to fight Captain Cook in 1770, shows how subject they were to the head-hunting forays of the Papuans.

Standing on the end of Cape York, the geologist notes, to the northward, a cluster of lofty granitic islands, from the latter may be seen more islands extending northwards, and so on right across the Strait. These islands are the peaks of a drowned mountain range, the continuation of the Australian cordillera. In past ages this range, standing at a higher level, bridged the Strait by an isthmus which linked Australia to New Guinea. At that time the shore of the continent extended to where the Barrier Reef now is.

Geologically the Strait falls into three divisions, the continental islands just described, the low coral islands to the east of them, and, on the extreme north-east, a group of volcanic islands. The largest of these is Mer or Murray Island, on which the rim of a large ash crater is still distinct. The two monsoons have piled the ash into a tall hill and a low one, the work respectively of the N.E. and the N.W. monsoons. Numerous blocks of dolomitised coral among the ash show the crater pipe to have burst through a deep-seated stratum of coral.

To a biologist the Strait would always be a happy hunting ground. South from Cape York, and diminishing as we recede, are a number of New Guinea plants and animals. Contrasted and supported by another series of Australian plants and animals occurring in New Guinea, these add force to the geological argument for a former isthmus across Torres Strait. By that route the cassowary and the palms travelled south, while the marsupials and eucalypts went north.

In marine zoology the Strait is famous for the extensive beds of pearl-shell (*Meleagrina maxima*) that occur there. Over a large area the water is maintained at an unusually high temperature. This fosters a rich growth of corals and associated organisms. The dugong has not yet been extirpated, and affords, to the natives, an important food supply.

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